For producers of Sand d Gravel, Crushed Stone, ent, Lime, Gypsum, and her nonmetallic minerals

MARCH 1956

PIT and QUARRY

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Quarry View at the New Stockbridge Stone Company Fluxstone Plant, Calera, Ala.

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BAGPAK PALLET
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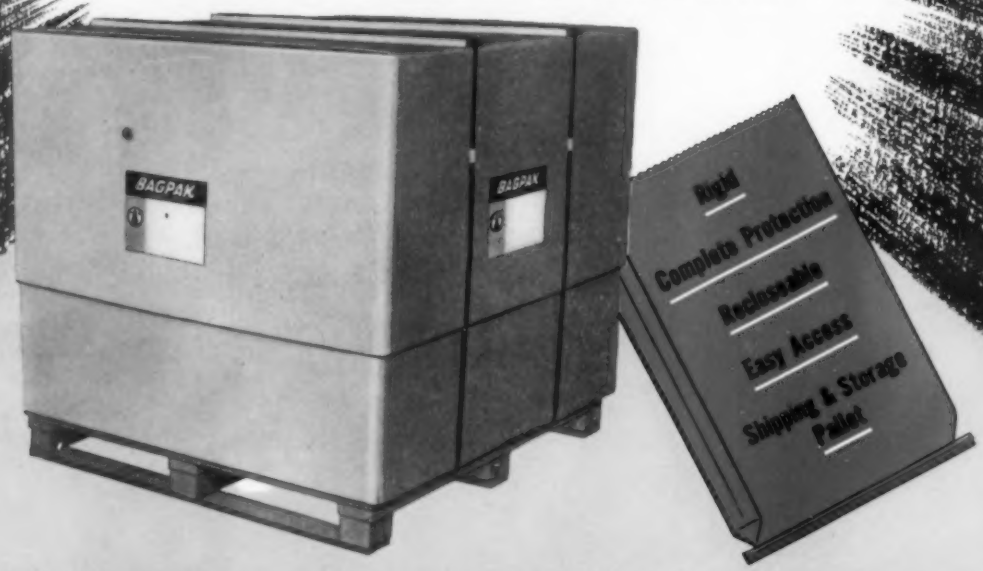

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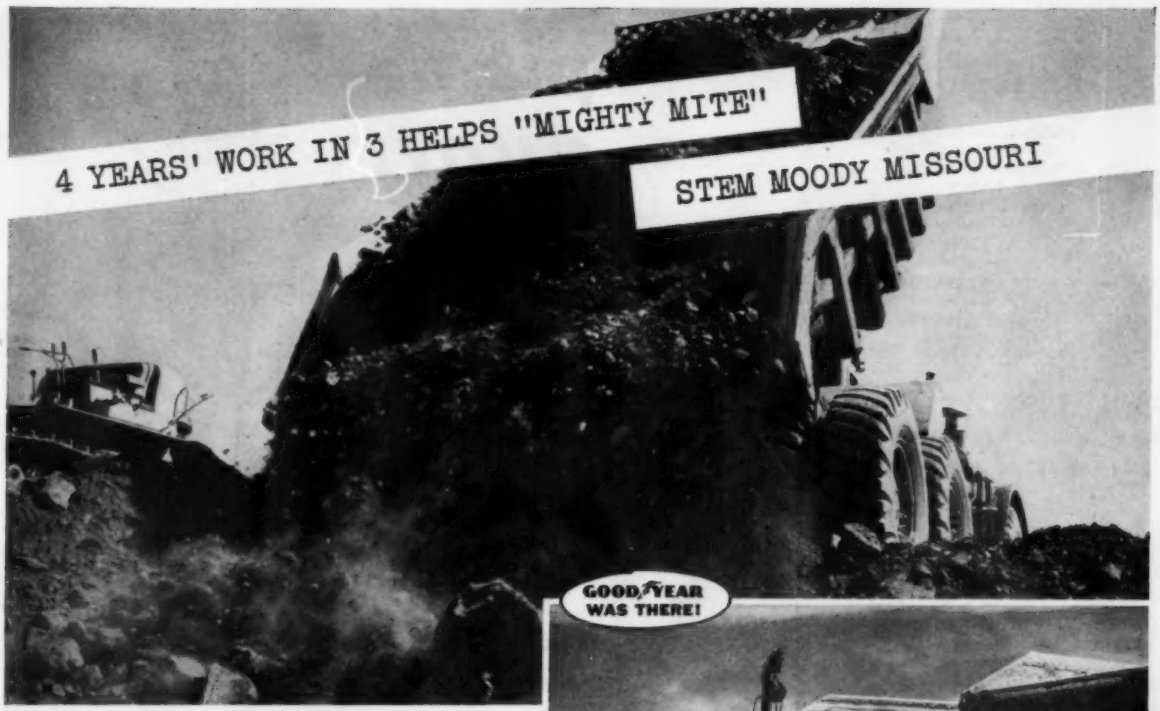

THE GAVINS POINT DAM is a "mite" compared with its giant fellow dams of the vast Missouri Basin Development Program. But Gavins' 8,700-foot crest length and 800-foot base-width make it a MIGHTY mite. After a flooded-out start, 2 million yards were moved in a record comeback and classic 8-day closure, spearheaded by end-dumps as shown above. The tires are Hard Rock Lugs by Goodyear.

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PIT AND QUARRY IS INDEXED IN THE ENGINEERING INDEX

pit and quarry

THE BASIC MAGAZINE IN A BASIC INDUSTRY

MARCH 1956—vol. 48, no. 9

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Published on the first of each month for producers and manufacturers of Cement, Crushed Stone, Gypsum, Lime, Sand, Gravel and other nonmetallic minerals. Copyright 1956 by Pit and Quarry Publications, Inc., 431 S. Dearborn Street, Chicago 5, Illinois. PIT AND QUARRY magazine was founded by H. W. Baumgartner, October, 1916.

To subscribers: When requesting change of address, kindly send old as well as new address.

The following notes are quoted by permission from an actual letter written by one quarry operator to another...

My boss thinks you should read this...

YOU CAN'T BEAT THIS COMBINATION

...exclusive EASTON electric overhead dumping system and EASTON doorless pan trailer. EASTON trailer capacities range from 10 to 36 tons. For exceptional grades the EASTON pan body may be truck-mounted.

MY BOSS *is a very fair man. He has end dump trucks and side dump trailers and uses both on jobs for which they are suited. But, when another quarry man asked us what we find best for* straight quarry work, *here's what my boss dictated:*

"BOTH TYPES of trucks are required to meet our operational requirements. Were ours a straight quarrying operation, we undoubtedly would favor the side dump trailer units for the following reasons:

"1—Side dump trailer units carry greater pay loads using the same truck as a tractor that is used with the end dump bodies (side dump unit capacity, 35 tons,—end dump unit capacity, 22 tons).

"2—Less spillage experienced hauling 35 tons with side dump units than 22 tons with end dump units (attributed to backs on the side dump trailer units).

"3—Shovel operators claim that loading the side dump units is easier.

"4—Though our roads are maintained for the very best of haulage conditions, racking of loads could be a problem, and in this instance longer unit chassis life should be experienced in the trailer type haulage unit through the better load distribution and the trailer universal action at the tractor hitch.

"5—Dumping at the crusher takes about the same time for both units. The side dump units are dumped by a push-button controlled electric overhead hoist, operated by an attendant at the crusher."

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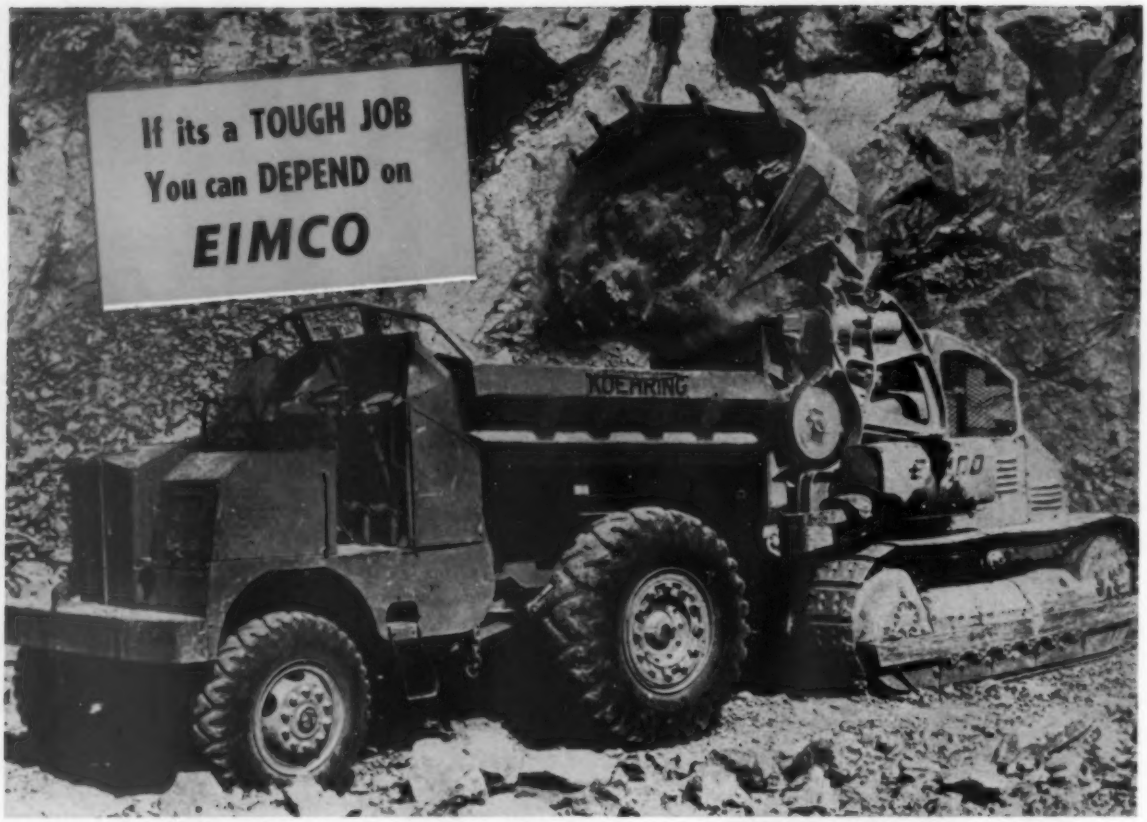

Hard, Rough, Tough Jobs Need Eimco Dependability

This case study concerns one Eimco 105 loader on which an open pit mine depends for its entire production.

Location — in an isolated and remote area of Southwest Africa.

Conditions — dusty, dry and hot. Pit floor uneven-solid rock.
Mining — selective
Operators — native
Maintenance — Nil

Report — The Eimco 105 Tractor Excavator has operated some 3200 hours on consecutive two shift basis under the most difficult conditions. Native operators are unnecessarily abusive of the equipment. The ore is exceptionally abrasive and heavy. No other loading equipment is available so the Eimco must stay on the job. One operator ran the 105 a complete shift without fan belts, both of them run the machine to the solid rock wall and spin the tracks when cleaning out an ore pocket.

Eimco does not recommend abuse on their tractor-excavators or any other equipment but Eimco produces a machine that can stay on the job day in and day out—month in and month out—when you are depending on it and when plant capacity depends on a single production loading unit.

There are many reasons for Eimco superiority on the tough jobs. The design of an Eimco is simple-strong. The material of construction is all alloy steel. The operating features make it the easiest tractor to operate and the most maneuverable. When you need guts in a tractor, compare an Eimco with anything you are using or have used previously.

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B-173

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The Model 41 Northwest brings you the ability and capacity for greater output and does all the other things that you want a rig to do.

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Find out about this proved 1 yd. Northwest. Let a Northwest man give you the full story.

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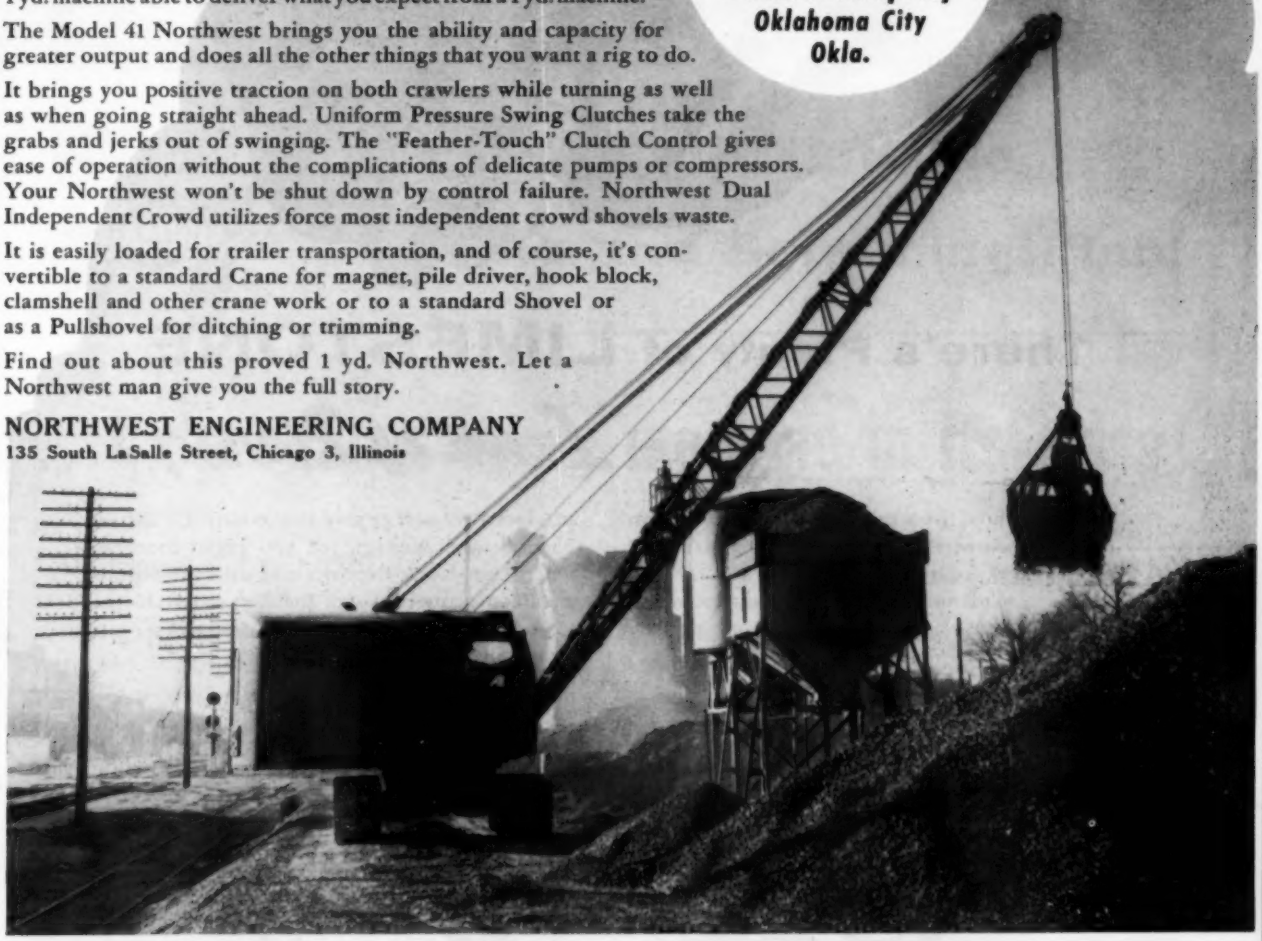

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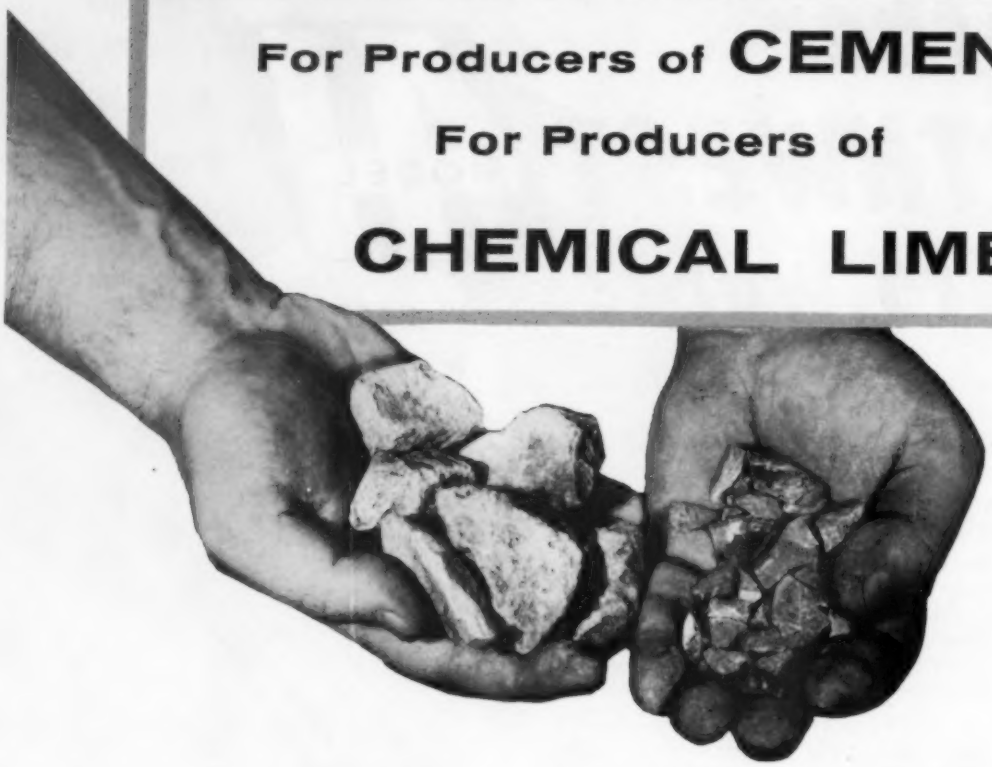
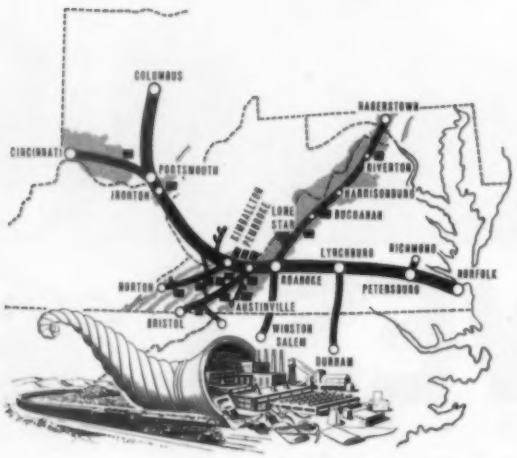


There's Plenty of LIMESTONE

in the *Land of Plenty!*

Throughout the area indicated by shading on the map below, there's a proven abundance of *high-calcium limestone.*

If you're planning a plant to produce cement, chemical lime and other limestone derived products, *get next to your raw material.* Let the Norfolk and Western tell you about locations where limestone deposits and other important advantages meet your specific requirements. Complete and detailed information — in confidence. No obligation.



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Moves from one working location to another are accomplished with a minimum of down time. A hydraulically operated mechanism lowers the screen deck to travel position in a fraction of the time required for manual knockdown.

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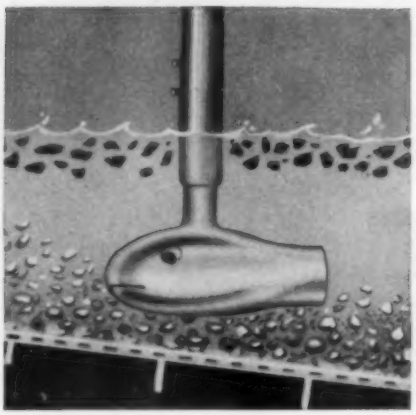
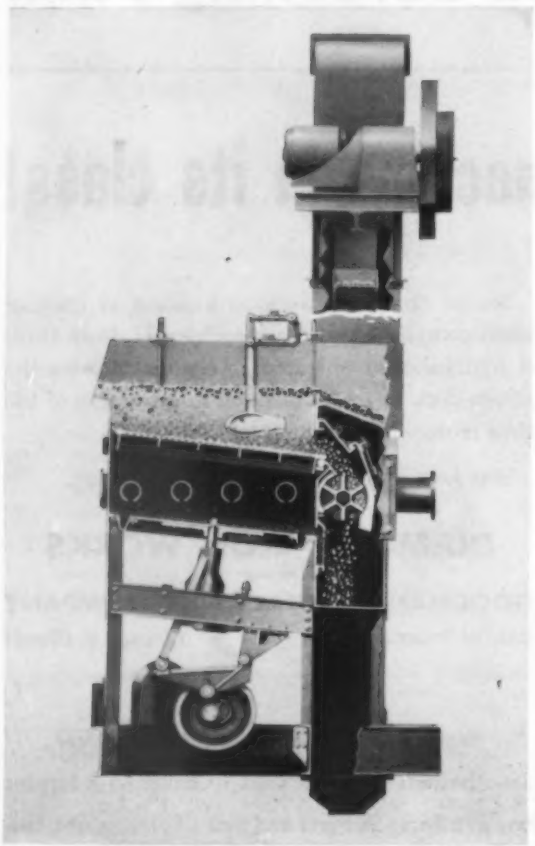
Jigging stratifies materials according to specific gravity, separating solids in upward and downward pulsations of water. The heavier materials settle to the screen plate and are drawn off. The lighter materials overflow.

Jigging is a universal separating process for materials ranging from the specific gravity of gold at 19 to coal at 1.3. Proportions of high gravity materials may vary from 90% to 10% or less. It is applicable to any separating problem where there are even small differences in specific gravity.



a low-cost method of cleaning your sand and gravel...



Cross Section of Jeffrey Heavy-Duty Sand-and-Gravel Jig.

• You can increase your production and profits with a Jeffrey sand-and-gravel jig. Materials as quarried are fed to the jig. Coal, shale, clay, roots and sticks are removed, leaving sand and gravel of marketable grade. Capacities up to 75 tons per hour.

Jeffrey jigs have been used successfully for many years. Jeffrey engineers are fully qualified to advise you on sand-and-gravel problems.

Bulletin 892 describes Jeffrey sand-and-gravel jigs and gives data useful to men who are laying out a plant. For a copy, write to The Jeffrey Manufacturing Company, Columbus 16, Ohio.

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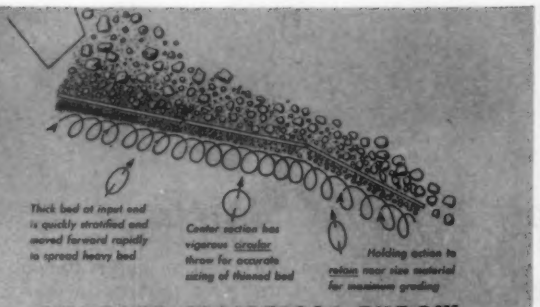
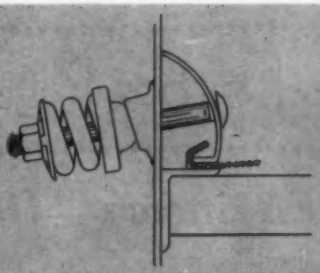

Thick bed at input end is quickly stratified and moved forward rapidly to spread heavy bed
Center section has vigorous circular throw for accurate sizing of thinned bed
Holding action to retain near size material for maximum grading

OPPOSED ELLIPTICAL THROW

Deister's exclusive powerful throw action provides more capacity per square foot. Movement of material on the screen is controlled accurately, for the greatest speed and efficiency in sizing.



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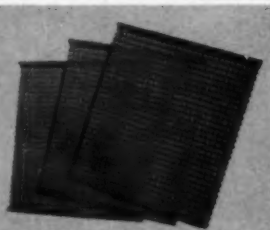
Powerful tension springs hold screen cloth (either with hook strips or clamping angles) in tension over series of cross members arranged in arc. Positive tension, plus curvature, prevents whipping of cloth.



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On the Type UHS (illustrated below).

Sections are identical in size; may be readily interchanged or shifted, to distribute normal wear and prolong life of screening medium. Any screen may be changed without disturbing remaining sections.

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Deister
Type UHS

Features side or transverse tension. Provided in 3, 4, 5, and 6 ft. widths; 10, 12, 14, and 16 ft. lengths; single, double, triple decks.

Higher Tonnage — Lower Costs with DEISTER

If specifications are tougher . . . if competition is keener . . . you can't afford to invest in anything but the best and most efficient equipment. And you'll need *dependability* too . . . a rugged screen that can produce hour after hour—day after day without downtime. These are just a few of the reasons why you should investigate Deister Screens.

Remember, Unitized Lifetime Vibrating Mechanism, Opposed Ellipical Throw . . . these and many more now proven innovations in screen design were developed by men who specialize in one thing . . . sizing and separating equipment.

And remember too, that Deister Screens are backed by follow-through service that has no parallel . . . for DEISTER top management is personally interested in the continued profitable operation of every DEISTER screen in the field.

DEISTER MACHINE COMPANY

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The Editor's Page

Engineers—Our Most Serious Shortage

IN recent months our attention has been called with increasing emphasis to two related subjects — the rapid trend toward automation, and the growing shortage of engineers. Automation is in itself nothing to worry about; history has proved that mechanization has created jobs rather than destroyed them, and automation is just another step in the mechanization of industry which has been going on for some years. Actually, there is more danger now that, unless we progress further and more rapidly with automation, there will soon be a serious labor shortage due to our climbing industrial production.

A labor shortage — even of skilled labor — is much less of a problem than the shortage of engineers and other trained technicians, a trend which is rapidly getting worse. Only a year or less after high school is usually required to train skilled labor, but the training of competent qualified engineers begins in high school and continues through college and at least a few years of practical experience. As a result, intensive efforts begun now will not materially affect the situation for some years to come.

RUSSIA is again being held up as the bugaboo in the engineering picture. As we pointed out in these pages only a few months ago, Russia is graduating more than twice as many engineers and trained technicians each year as we are and will soon pass us in numbers. This situation will continue to get worse unless we do something drastic about it, beginning at the teacher level. Russia apparently has no shortage of technically-trained instructors; in 1940 there were 28 students per teacher, and in 1950 the ratio was down to 23 to 1. The reverse is true in this country. Actually, we are losing the cold war to Russia in our schoolrooms.

Most of our allies apparently have similar problems, except perhaps England. There pressure was brought in 1946 to double the output of scientists and technologists, and this goal was achieved by 1950. Even so, the supply has reached only 75 percent of the demand, and there is some evidence that quality has been sacrificed to quantity.

ONE reason for our shortage of engineers undoubtedly lies in the low salaries they received in years gone by. As a result, the engineering profession, along with teaching, lost much prestige, for we are prone to judge people by their incomes. The shortage of engineers in recent years has put this profession in higher income brackets, and much of this prejudice has been overcome. Probably a more important reason now is the fact that only students of superior ability can become competent engineers, and our youth prefers easier roads to success. There is also an obsolete belief that engineers seldom achieve positions of top responsibility in management. This is no longer true. A recent study of large business firms shows that the number of presidents of companies who started out as engineers is far greater than those who come from any other profession.

The seriousness of our technical emergency is becoming more widely recognized in educational, governmental, and industrial circles; and drastic steps have already been taken to improve the situation. Colleges are seeking out high school students of superior ability and making it possible for them to prepare for engineering and science careers. More and more large corporations are establishing scholarships and fellowships or setting aside funds to help engineering colleges and universities. Technical and trade associations are helping by establishing fellowships and by co-operating in the training of engineering students.

SOME of the larger nonmetallic-minerals-producing companies are already co-operating in this effort, but these industries as a whole have done comparatively little. Company officials should take an interest in the sons and daughters of their employees. Those with the necessary ability and intelligence should be encouraged and helped to obtain a technical education. These young people and other engineering students should also be given jobs during summer vacations, with the added objective of encouraging them to enter this field after graduation. Many companies can also justify the creation of scholarships with the same objective.

A New Association—N.C.L.I.

PIT and QUARRY welcomes to the already large number of associations in the nonmetallic minerals industries a new national group—the National Crushed Limestone Institute, Inc. This young and growing organization received its charter on November 28, 1955, and held its first annual meeting in Chicago on February 16, 1956. At that meeting officers and directors were elected to replace those who had served until a regular election could be held.

This new association, citing one of its own letters, was formed by a group of limestone producers who believe that aggressive action is necessary to insure the passage of a suitable highway bill in this session of Congress. More specifically: ". . . it is hoping to play a leading role in securing compromises in the extreme positions which played such a leading role in defeating efforts to secure legislation for an expanded highway program last year."

While N.C.L.I. was initiated by members of the National Agricultural Limestone Institute, it was organized independently of that or any other group. Its membership is composed only partly of N.A.L.I. members and, it is stated, is open to any producer of aggregates, whether or not he belongs to any other association. Arrangements have been made to use the N.A.L.I. staff and facilities at a specified amount per month. The address is 619 F Street, N.W., Washington 4, D.C.

Walter E. Trauffer

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A Texaco Lubrication Engineer will gladly help you simplify your lubrication, step up efficiency and save money throughout your operation. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

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Washington News Letter

PRESIDENT Eisenhower's annual budget message to Congress indicated a balanced budget for the next fiscal year, July 1, 1956, through June 30, 1957. He also reported that as a result of better-than-expected revenues, a balance has also developed between federal income and expenditures in the present fiscal year, which ends on June 30, 1956.

Although the budget for the next fiscal year looks as if it will balance, this situation will result from an increase in income, not from a reduction in expenditures. If the President's recommendations are followed, expenditures will, in fact, rise. The overall figures for last year, this year, and next are as follows:

	Receipts (Billions)	Expenditures (Billions)	Surplus or Deficit (Billions)
Fiscal yr. ending 6/30/55	$60.4	$64.6	$4.2 deficit
Fiscal yr. ending 6/30/56	64.5	64.3	.2 surplus
Fiscal yr. ending 6/30/57	66.3	65.9	.4 surplus

For the next fiscal year, receipts are expected to be $1,800,000,000 higher than this year, while expenditures are expected to be $1,600,000,000 higher.

The question of where these budget increases will go is of special interest. As usual, the lion's share will be devoted to national security expenditures. The principal cause for this increase is the rapidly rising costs of the newer weapons—air atomic power, guided missiles, etc. Also, foreign military aid is to be increased slightly and foreign economic aid by a relatively large amount. Between national security and economic aid, two-thirds of the budget increase is accounted for.

Most of the remaining one-third is scheduled to go to domestic projects, of which the regular highway aid program and the proposed new grants-in-aid to the school construction program are the principal components. These grants-in-aid are regarded as a temporary expedient designed to help the states catch up on much needed school construction. The exact amount which the Federal Government would put up it still quite uncertain. Figures from $400,000,000 to $1,000,000,000 a year have been mentioned.

The Eisenhower budget message which announced the possibility of balance for only the third time in the last 25 years was, of course, greeted with loud hurrahs. The budget was balanced most recently in 1947 and 1951, both times in the Truman Administration.

However, when the details were analyzed, many persons, in and out of Washington, were disappointed. When the President took office, his budget balancing program involved radical contraction in federal expenditures. To some extent this has taken place. Expenditures dropped from the almost $78,000,000,000 level of the last years of the Korean war to a level of about $64,500,000,000; but this is where the disappointment sets in. Next year the downward trend is going to be reversed.

Actual expenditures are likely to be higher than indicated. It is not at all unusual for Congress to appropriate more than the President requests for many of its pet projects. Furthermore, the President's expectation that he will be able to pay for a part of the farm program out of receipts from the sale of farm surpluses in the open market may not be realized because of the rising opposition of farm groups who fear that such sales would depress prices. The President is also counting on a rise in postal rates to help offset the postal deficit. This increase is quite uncertain in an election year. All told, the relatively narrow margin of safety in next year's budget could disappear very easily.

Whether the margin remains or not, it is so narrow that it has dashed most hopes for substantial tax relief. The President has placed budget balancing and his program above tax relief on his list of priorities.

The "viewers with alarm" see in the President's budget message a yielding to the forces who automatically turn to the Federal Government for the solution of their pressing problems. They are especially concerned about the federal aid to schools program. They see the small initial payments contingent upon the states making appropriations of their own as just "a foot in the door". They can see no alternative to increasing payments to support school construction and, perhaps, later to support the operation of those schools.

They are also disturbed by the large number of small appropriations in the areas of agriculture, education, highways, research, flood control and aids to labor surplus areas. While these are too small to be of great immediate concern, the fear is that each program may become a nucleus of pressure for bigger demands in future years.

The Proposed Highway Program

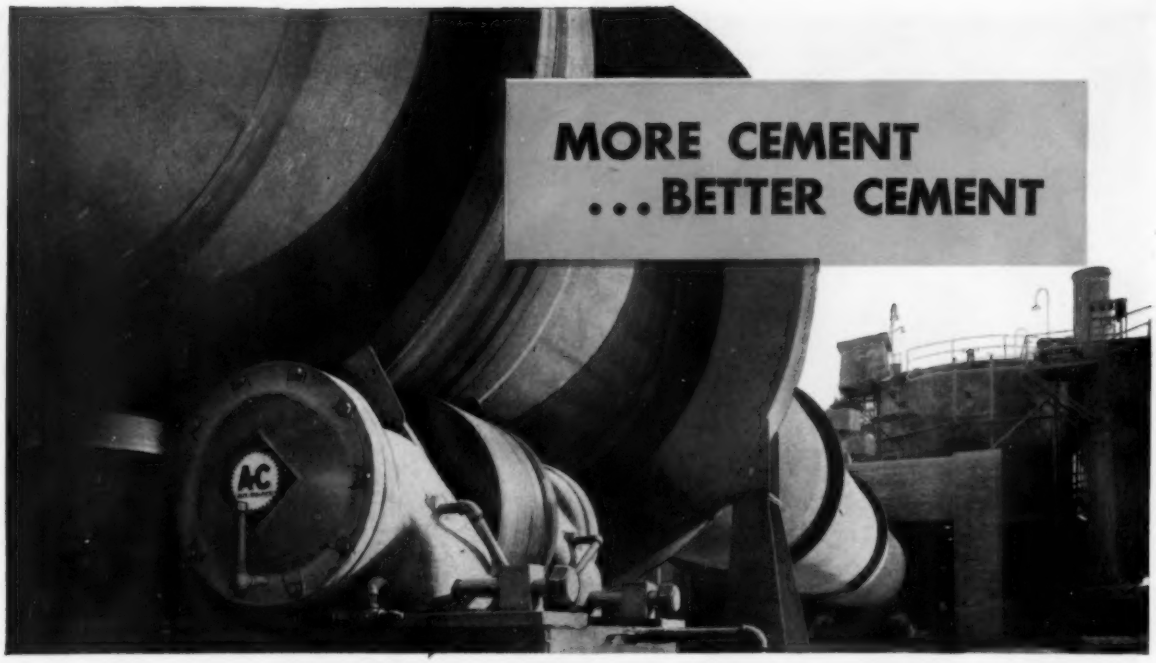
The President's budget did not include his proposed new highway program because that is expected to be financed by tax revenues beyond those accounted for in the budget. Indeed, it was the method of financing which killed this program in the last Congress.

It now appears as though an agreement on financing, which will be primarily a pay-as-you-go scheme, is in the making. It looks now as if the compromise will be an increase in gasoline taxes and an increase in the excise taxes on diesel fuel, tires and tubes, trucks, trailers, and buses. These would probably be sufficient to raise the Federal Government's share of $37,500,000,000 in the 13 years 1957 to 1970. To get the Federal Government's share, the states would have to add $14,000,000,000 of their own money to this program.

If this program goes through, the total amount spent annually on road building will increase many times. states. If they can raise all the neces- How many times will depend on the sary money to qualify for the federal grants, highway building alone will be a $4,500,000,000 per-year business, which would be a substantial underpinning to the national economy. Added to the school building program it would assure prosperity for most of the branches of the construction industry.

The Wible Construction Company, Sherman, Tex., is establishing a rock-crushing operation on a 1,426-acre site near Hugo, Okla. Limestone resources at this location were said to be sufficient for the next 20 years.

At Sheridan, Ore., Robert S. Burch and Harold W. Burch (brothers) recently dissolved their partnership. Robert Burch will retain the Burch Gravel Company, and Harold Burch will operate the old firm's ready-mix business and a building block plant recently purchased from the late Elmer Berkey.



Are you set up to meet Volume and Specification demands?

Accelerated construction programs call for a 35% increase in cement production by 1959. You're in for some profitable years if you gear your plant to meet the challenge.

Allis-Chalmers Can Help You and Your Consultants

Evaluating your present process should be your first step in expanding. Here is where Allis-Chalmers — with more than 50 years' experience in building and applying cement-making equipment — can help.

Allis-Chalmers is not only concerned with machinery application, but with overall plant efficiency. Increased grinding and burning capacity — better heat recovery — faster clinker cooling — maximum fuel utilization — lower power consumption — maintenance economy — are all vital considerations. Only with this approach can you achieve capacity increase and quality improvement at the lowest cost.

Yes, you get more . . . more engineering co-operation when you specify A-C.

Allis-Chalmers Rotary Kilns

Over half of all cement made in the U. S. is processed in A-C equipment. The reason? Allis-Chalmers has pioneered many major improvements in machinery design. For example, air-cooled kiln feed and discharge ends save rebricking cost and prevent shell distortion. True circle, all-welded construction insures best lining fit, long refractory life. Floating-type riding rings provide flexible support and proper weight distribution.

For complete information, see your local Allis-Chalmers representative or write Allis-Chalmers, Industrial Equipment Division, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS

A-4970

"Coordineered" Equipment for the Cement Industry

Tumbling terrain buried more than 500 feet of 5-year-old Anaconda 3/0 Awg SH-D Shovel Cable. Despite accident, cable continued to supply power without interruption to giant shovel.

...and the wall came tumbling down

When this 90-foot wall came down unexpectedly, a five-year-old length of Anaconda 3/0 SH-D Shovel Cable was buried under thousands of tons of jagged rock.

Yet – *after ten days* – the cable and shovel it supplied continued to operate! Later, the cable was relocated–and is still giving service.

NEW BUTYL INSULATION

Longer life, better performing cable is the result of advanced engineering and manufacturing know-how that go into all Anaconda mine cables. Securityflex* Type SH-D Shovel Cable, for instance, is made with high-grade butyl insulation that withstands ozone, heat and moisture. Neoprene jacket is extremely tough and abrasion-resistant. Patented rubber cores cushion the ground wires and help prevent breaks.

Safety and economy of Anaconda cables have been proven in mines all over the world. The *Man from Anaconda* will be glad to help you on any cable problem. For cable, see your Anaconda distributor. And for copy of booklet, "*. . . and the wall came tumbling down,*" write: Anaconda Wire & Cable Company, 25 Broadway, New York 4, New York.

*Reg. U. S. Pat. Off. 56329

ASK YOUR DISTRIBUTOR FOR

Sharp corner of rock caught and held taut the Anaconda Shovel Cable – but didn't break it.

Giant rock scissors pinched the cable in viselike grip without damage to insulation or ground wires.

Like a guillotine, yet tons of rock did not puncture cable nor interrupt flow of power to the shovel.

Rockfall crushed and partially buried the cable all along its length – but not a single break occurred.

ANACONDA® MINE CABLE

In the Construction Industry...

SYMONS® CONE CRUSHERS

meet the demand for vast tonnages of fine aggregate and sand of proper gradation and quality

FOR DAMS AND HYDRO PROJECTS...

like the hundred million dollar Hungry Horse project at Kalispell, Montana, where the General-Shea-Morrison contracting group built one of the largest and highest dams in the country.

(Bureau of Reclamation Photo)

FOR MODERN EXPRESSWAYS...

like the modern Detroit Expressway, with its many interchanges designed for easy, safe access to this high speed highway . . . a good example of the big job being done by the construction industry to help meet the country's highway needs.

(Abrams Aerial Survey Corp. Photo)

FOR BRIDGE CONSTRUCTION...

like the famous George Westinghouse Bridge in East Pittsburgh, Pa. The 460-ft. center span of this bridge is the longest reinforced concrete arch in the United States—and stands as a tribute to the skill and ingenuity of the designers and builders.

(Portland Cement Assn. Photo)

FOR COMMERCIAL AND RESIDENTIAL BUILDINGS...

like the Park La Brea housing project in Los Angeles. Costing $40,000,000 and providing living quarters for 13,000 people, this unit is the largest architectural concrete project in the country.

(Portland Cement Assn. Photo)

• Illustrated here are just four examples of the vast contributions to the progress of mankind being made by the construction industry. With the advent of modern engineering and huge construction projects such as these, specification concrete aggregate has assumed an increasingly important role. To meet the constantly growing demand for vast tonnages of quality aggregate, Symons Cone Crushers have long been the first choice of leading producers throughout the world. In addition, Symons Cones are widely used for preparing sand to meet the rigid specifications prevalent in concrete construction.

For in aggregate and sand production . . . *as in all of the great ore and industrial mineral operations the world over* . . . there has been no record to equal the performance of Symons Cone Crushers that have so consistently and efficiently produced great quantities of finely crushed product at low cost.

Long accepted by experienced contractors and producers for efficient stationary crushed aggregate plants, increasing numbers of successful operators of portable and semiportable crushing plants are now using these sturdy, economical Symons Cones for big capacity of fine product.

Whether you are a contractor, operator, construction engineer, designer or manufacturer, it will pay you to specify and use Symons Cone Crushers . . . as well as the other Nordberg Machinery for the construction industry . . . *all* designed and built to deliver maximum output at lowest possible cost.

Write for literature on the machinery you need.

NORDBERG MFG. CO., Milwaukee, Wisconsin

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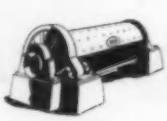
SYMONS PRIMARY GYRATORY CRUSHERS

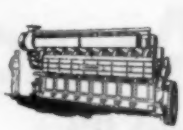
SYMONS VIBRATING GRIZZLIES and SCREENS



GRINDING MILLS

SYMONS V-SCREENS

ROTARY KILNS and COOLERS



DIESEL ENGINES — 10 to over 12,000 H.P.

SYMONS Cone Crushers . . . the machines that revolutionized crushing practice . . . are built in Standard, Short Head, and Intermediate types, with crushing heads from 22 inches to 7 feet in diameter—in capacities from 6 to 900 tons per hour.

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SYMONS...

A REGISTERED NORDBERG TRADEMARK KNOWN THROUGHOUT THE WORLD

A TRIPLE COMBINATION *at its* **rugged best**

Just think of the mobility and drilling efficiency you can get from this quarry rig!

ONE—you've got a maneuverable 600 cfm. Power Vane Rotary Compressor for a completely dependable air supply. Its oil injection system provides copious lubrication during off-level operation, yet oil consumption is low. A variable speed capacity regulator helps prolong engine life and reduce wear and tear.

TWO—you've got a rugged pair of CP Drill Arms. Both booms are readily adjustable to any drilling position ... vertical adjustments are made by a rotary air motor ... lateral positioning is controlled by air-actuated post locks. Automatic safety locks prevent boom arms from settling.

THREE—*and to top it all off,* mounted on the drill arms you've got two CP drill carriages whose tubular construction provide the rigidity and strength to stabilize and feed the two hard hitting, strong rotating CP-70NDC Drifters.

For more details on how you, too, can set up a CP team to go to work in your quarry write, *Chicago Pneumatic Tool Company, 8 East 44th Street, New York 17, N. Y.*

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News of the Industry

Alpha Portland Cement Plans $6,860,000 Expansion Of St. Louis Facilities

The Alpha Portland Cement Company has announced plans to expend approximately $6,860,000 on the expansion of facilities at its St. Louis, Mo., plant. The new installations at this mill are a part of an overall integrated program for the improvement and expansion of Alpha's manufacturing facilities.

The program at St. Louis will include expansion along the entire line of cement manufacture, beginning with increased raw-grinding facilities and additional slurry storage tanks. A new 11- by 380-ft. kiln and cooler plus the additional housing and new accessory equipment, are the main items. After burning, the cement clinker will be ground in the new finish-grinding department. Ten additional cement storage silos and a bulk loading plant will be built.

All of these improvements will require additional auxiliary equipment and buildings, as well as subsequent changes in electrical transformer and transmission capacity, railroad sidings, roadways, and water supply.

Kaiser Plans $8,000,000 Plant To Make Caustic Chlorine

Kaiser Aluminum & Chemical Corporation will construct an $8,000,000 caustic-chlorine plant adjacent to the company's new alumina plant to be built at Gramercy, La. Caustic soda is an important raw material in the refinement of bauxite.

The new plant will be the first one of its kind to be owned and operated by a U. S. producer of aluminum as a part of its integrated operations. D. A. Rhoades, vice-president and general manager, announced the project.

Johns-Manville Exploring Gypsum Deposit in Nevada

Spokesmen for the Johns-Manville Corporation have announced that the firm has an option to explore a large gypsum deposit in southern Nevada and is considering entering the gypsum business.

It was also indicated that Johns-Manville is examining other gypsum deposits in various parts of the United States. The Nevada bed is between Las Vegas and Henderson.

In the event that Johns-Manville enters the gypsum field, products such as gypsum board, plaster lath, and gypsum sheathing would be added to the firm's line.

Major Expansion Anticipated At Gypsum Lime & Alabastine

Officials of the Gypsum Lime and Alabastine Company of Canada, Ltd., Toronto, Ont., stated that the firm will double production within the next 25 years and spend about $30,000,000 doing it.

This forecast, released by P. M. Gross, president of the company, is based on future increased population and the amount which will have to be spent on construction.

Mechanization will enable the firm to produce more goods per employee, although the present staff is expected to remain constant. Mr. Gross made this statement to the Royal Commission which is examining Canada's economic prospects.

Gypsum Lime and Alabastine has 18 plants across Canada, producing plaster boards, plastering materials, mineral wool, building lime, etc.

Coming Events

April 19-21, 1956—Boca Raton, Fla. Spring meeting, National Lime Association. Boca Raton Hotel.

June 17-22, 1956—Atlantic City. 59th annual meeting and 12th apparatus exhibit, American Society for Testing Materials. Chalfonte-Haddon Hall.

July 12-13, 1956—Lake Placid. Mid-year directors' meeting, National Crushed Stone Association. Lake Placid Club.

Cement & Quarry Section Plans for Safety Congress, Maps Activities for Year

Future safety activities of the Cement and Quarry Section of the National Safety Council were planned during a meeting of the section's executive committee at the Commodore Hotel in New York City on January 17. Nineteen committee officers were present.

Given major attention at the meeting was the selection of subjects for the Cement and Quarry Section's program at the National Safety Congress, scheduled for the week of October 22-26 in Chicago. Program Chairman Bill Kipp, Universal Atlas Cement Co., plans to develop a well rounded program directed towards the particular interests of the cement and quarry members. Topics selected for development were: visual aids showing unsafe conditions and the correctives applied, proper handling of industrial solvent and welding fumes during maintenance operations, safety incentive programs used by member companies, a skit illustrating safety training techniques, and the facts surrounding six fatalities in the cement and quarry industries.

Other activities planned for the year include a concentrated drive to obtain a 10 percent increase in section membership. Revision of the Council's lime data sheet has been nearly completed by the Engineering Subcommittee; and Chairman Lea Warner of the Warner Company, announced that a new safety data sheet covering pulleys and conveyor belts was planned for development during the year. Plans for off-the-job safety were discussed, and a special committee was appointed to consider a new and more inclusive name for the section.

As the initial phase in a $4,000,000 expansion program of the Calaveras Cement Company at San Andreas, Calif., the firm recently completed a series of new storage silos. When the remaining facilities are completed, the company will have nearly doubled its present production.

January Building Awards In 37 Eastern States Hit Record $1,858,228,000

F. W. Dodge Corporation's reports of contract awards for future construction in the 37 eastern states set a new high record for January at $1,858,228,000. This was 25 percent ahead of the previous January record, set last year.

Awards for residential building totalled $694,392,000, reversing a declining tendency which appeared late in 1955 and rising to a new record high, 3 percent above the record set in January, 1955. This marks the fourth successive year in which new January residential records have been set.

Dodge reports on totals of awards for non-residential building also set a new record of $661,275,000, 17 percent ahead of January of last year. The increase was accounted for by rises in contracts for manufacturing buildings, schools, and institutoinal buildings; other non-residential categories reported declines.

Heavy engineering contracts showed the greatest percentage increase. The total of $502,561,000 for public works and public utilities was a new record, up 102 percent over January, 1955. Dodge's heavy engineering classification for January must be appraised in the light of the fact that there were several unusually large projects in Pennsylvania and Ohio.

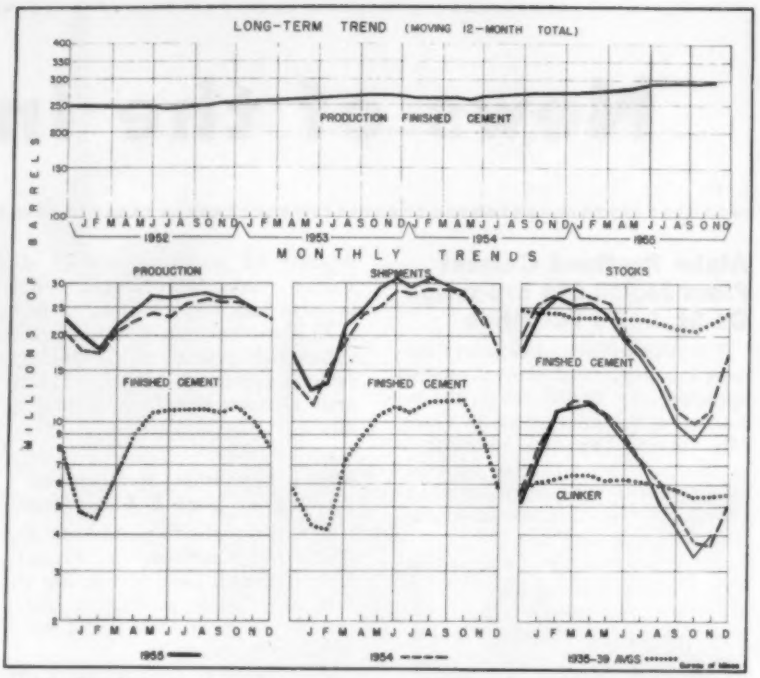
L. H. Yeager Sees Increase In 1956 Gypsum Production

The building industry can look for a huge increase in the availability of gypsum board products this year, according to Lloyd H. Yeager, general manager of the Gypsum Association.

The nation's gypsum manufacturers are currently expanding their plant facilities so rapidly, he revealed, that their productive capacity by the end of 1956 will be 30 percent greater than last year's, and more than double that of 1949.

Mr. Yeager cited the construction of ten new plants and enlargement of existing facilities at several operations as evidence of the industry's effort to meet the increasing demand for gypsum.

The Boca Raton Hotel, Boca Raton, Fla., is the site chosen for the spring convention of the National Lime Association. The dates are April 19, 20, and 21. This location, said to be furnished with "unsurpassed facilities", should draw a record attendance.


LONG-TERM TREND (MOVING 12-MONTH TOTAL)
PRODUCTION FINISHED CEMENT
MILLIONS OF BARRELS
J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D
1952
1953
1954
1955
MONTHLY TRENDS
PRODUCTION
SHIPMENTS
STOCKS
FINISHED CEMENT
FINISHED CEMENT
FINISHED CEMENT
CLINKER
1955
1954
1935-39 AVGS

SUMMARY—Production of finished portland cement in November, 1955, as reported to the U.S. Bureau of Mines, totaled 24,894,000 barrels—an increase of 4 percent over November, 1954. Mill shipments in November, 1955, totaled 21,682,000 barrels, a decrease of 5 percent, compared to November, 1954—while stocks of 11,663,000 barrels of finished portland cement on hand November 30, 1955, were 9 percent more than on the same date last year. Clinker production during the month totaled 25,618,000 barrels, an increase of 8 percent over the November, 1954, figure.

PRODUCTION—One hundred and fifty-six (156) plants in 37 states and Puerto Rico reported a production of 24,894,000 barrels of finished portland cement during November, 1955, as compared to 23,826,000 barrels during the same month last year.

Clinker production during the month of November, 1955, was 25,618,000 barrels, compared to 23,665,000 barrels during November, 1954.

Clinker figures for 1955 are not strictly comparable with those of 1954 and earlier years because producers are now asked to report clinker in terms of the number of 376-lb. barrels of finished portland cement that could be produced from the quantity of clinker in question, whereas previously the unit of measure was the 376-lb. barrel of clinker.

Separate data on high-early-strength (Type III) by districts and prepared masonry cements appear in this year's reports. Production of high-early-strength portland cement in November, 1955, totaled 932,000 barrels, a decrease of 8 percent, as compared to the November, 1954, production. The production of prepared masonry cement was 1,259,000 barrels of 376 lb. each.

SHIPMENTS—Mill shipments of finished portland cement were 5 percent less in November, 1955, than in November, 1954, and totaled 21,682,000 barrels. This figure and the district totals that comprise it are not strictly comparable with mill shipments of previous years because they do not include, as in the past, the number of barrels of finished portland cement used in the manufacture of prepared masonry cement.

Shipments in November, 1955, were higher in 7 districts and lower in 13. The greatest increases were registered in the Tennessee, Alabama, Texas, and western Pennsylvania-West Virginia districts. The greatest decrease was in the Oregon-Washington district, followed by the western Missouri-Nebraska-Oklahoma-Arkansas district.

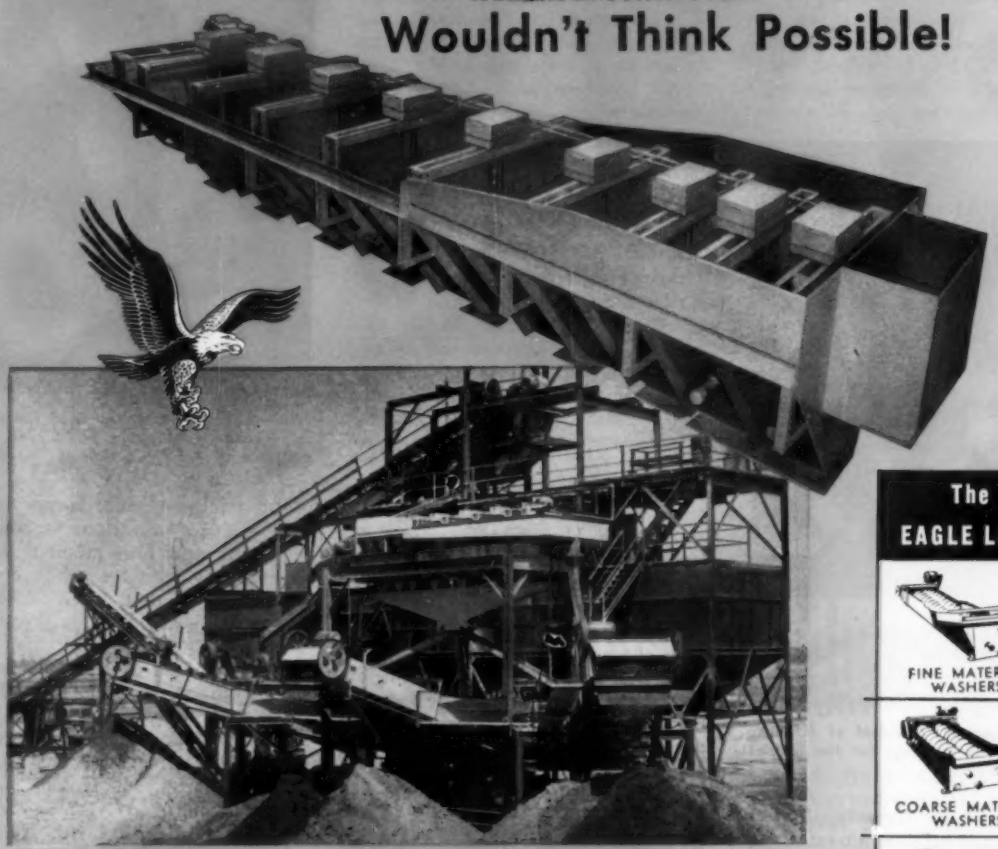
Mill shipments of high-early-strength portland cement in November, 1955, totaled 859,000 barrels. Nearly half of these shipments were from mills in the eastern Pennsylvania-Maryland and Michigan districts. No shipments were made from mills in Puerto Rico.

Mill shipments of prepared masonry cement in November, 1955, totaled 1,056,000 barrels. Nearly half of these shipments were from mills in four districts—Indiana-Kentucky-Wisconsin, eastern Pennsylvania-Maryland, Virginia-Georgia-Florida-Louisiana-South Carolina-Mississippi, and Michigan.

STOCKS—Mill stocks of 11,663,000 barrels of finished portland cement were on hand November 30, 1955—9 percent more than the 10,732,000 barrels on hand November 30, 1954. Stocks of clinker on hand at the end of November, 1955, were 4,062,000 barrels, an increase of 12 percent more than on hand November, 1954.

The National Safety Council will soon begin an intensive nationwide campaign to reduce accidental falls. This drive will seek to reduce substantially the number of falls in all areas by focusing the attention of management and workers on this one type of accident. The Council has singled out falls for special effort because of the great importance of such mishaps in the total accident picture.

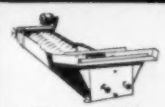
The EAGLE Water Scalping-Classifying Tank Gives You Classification You Wouldn't Think Possible!



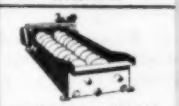
THE EAGLE Complete Washing-Classifying-Dehydrating Section at the eastern aggregate plant shown, has a 24′ tank equipped with 9 automatic, power-operated bleeder valves. Pit run sand is segregated into 9 distinct classifications, each flowing from one of the 9 valves. "Splitter" gates below each valve, in conjunction with the Multi-Cell Collecting-Blending Flume below the tank, permit directing of any percentage from each valve to any of the three Eagle Screw Washer-Classifier-Dehydrators. Or, any percentage from any valve can be wasted. Complete flexibility to produce any gradation—or variety of gradations—material to meet specifications.

You can increase the efficiency of your present Eagle Fine Material Washer or Washers—or other make—by installing an Eagle Water Scalping-Classifying Tank—whether yours is a dry pit operation, as shown, or a pumping operation. Send for the facts in Catalog 55.

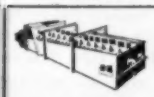
The EAGLE LINE



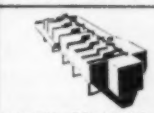
FINE MATERIAL WASHERS



COARSE MATERIAL WASHERS



LOG WASHERS



WATER SCALPING—CLASSIFYING TANKS.

"SWINTEK" DREDGE LADDERS

COMPLETE DREDGES

BREAKER BALLS & PILE HAMMERS.

EXPERIENCE, PROGRESS, SERVICE SINCE 1872

EAGLE IRON WORKS

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A.R.B.A. Convention Highlights Highway Program, Field Problems

IN FOUR days of discussion at the 54th annual convention of the American Road Builders' Association, January 11 to 14, federal, state, county, and city highway administrators concentrated their efforts toward plans for the consummation of the expanded road program on which legislation was then pending in Congress. Both the general convention sessions and an enlarged exhibit of highway materials and supplies were housed in the Miami Beach Municipal Auditorium.

John N. Robertson, president of A.R.B.A., and director of highways for the District of Columbia.

Included in the exhibit were features on recent developments in aggregates; bituminous materials; additives for bituminous materials and concrete; and salt, calcium chloride, and other chemical stabilizers.

The highway administrators, along with contractors, equipment manufacturers, and materials producers, were addressed by federal officials on the following subjects: the need for long-range planning to prevent waste and confusion in the road program, progress made in the elimination of red tape from the Federal-Aid secondary roads plan, and the ways in which state highway departments can alleviate their shortage of highway engineers.

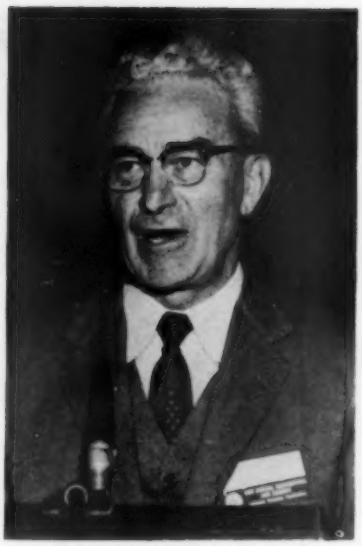
Other convention speakers, representing state highway departments and research organizations, discussed such field problems as the availability of road materials, required road equipment, and chemical stabilizers. According to estimates of the association committees, the fifth year of the road program annual cement requirements will be about 161,000,000 bbl. of cement, and the increase will continue at that level for the remainder of the program. Expected consumption of bituminous materials would show an increase of 7,000,000 tons over the current figure.

It was also estimated that in the first year alone an additional 46,100 units of road equipment will be required, to reach a total of 126,300 units, and that this figure will continue to rise during the second expansion year until 172,000 units are available.

On the subject of road and road base stabilization, the results of sodium chloride application received considerable attention. It was stated that the results of an experiment on a two-mile section of road indicated the danger of excessive salt application, but it was also pointed out that the increasing control of quantity, mix design, and compaction since that experiment, some time ago, is producing very favorable and acceptable results.

Companion benefits were reported to include improvement of road material, less maintenance, reduced loss of material, and substantial reduction of dust. In various sections of the country the fines inherent in the road bases which were stabilized with this chemical had such different origins as clay, rock dust, limestone, and silt.

Charles W. Smith, Southern district A.R.B.A. vice-president, and president of the Smith Engineering & Construction Company, Pensacola, Fla.



Julien R. Steelman, president of The Koehring Company, Milwaukee, Wis., and vice-president of A.R.B.A.'s Central District.

In concluding its general sessions, the association elected its new officers for the coming year, including John N. Robertson, president (re-elected), and the following district vice-presidents: Charles M. Noble, Northeastern; Charles W. Smith, Southern; Julien R. Steelman, Central; and W. A. Bugge, Western.

Presentation of the George S. Bartlett award, for contribution to the cause of better highways, was made to William Randolph Hearst Jr., publisher of the Hearst newspapers, by L. L. Colbert, president of the Chrysler Corporation. Mr. Colbert gave recognition to the extensive highway campaign conducted editorially by the Hearst organization.

Speakers at this latest convention of the road builders' group—which has been devoted to the cause of better roads for over 50 years—included 18 state highway officials. In addition, about 136 engineers from various highway departments participated in technical committee studies for the members in attendance.

JOHN E. VETTER, Portsmouth, Ohio, traffic manager of the Superior-Marquette Cement Company, has been named chairman of the Ohio Valley Transportation Advisory Board executive committee.

INCREASING FOOTAGE OF DIAMOND CORE DRILLS

with Stoody Acetylene Tube Borium

When we think of diamond studded tools, hard-facing seems unnecessary... after all, the diamond is nature's hardest, most wear resistant substance. Although core bits and their connecting reamers are set with industrial diamonds for extending overall life, the barrels and flutes don't benefit by these inserts. Here's how one operator increased footage of sampling drills from 400 or 500 feet to between 2000 and 3000 feet.

After making comparative tests of several hard-facing materials, 30-40 Acetylene Tube Borium (containing tungsten carbide particles) was selected because of its excellent wear resistance. Reamer bodies were hard-faced with a series of parallel longitudinal beads, the deposits extending around those areas containing the diamond inserts.

Since walls of the core barrels are thinner at each end because of internal threads, wear weakens these areas quicker than the remaining barrel. By hard-facing back 6" from each end and adding extra protection over the threaded areas overall barrel life is equalized. When the hard metal is gone the entire barrel has delivered maximum service. Flutes, attaching core barrels to drill rods, are hard-faced on outside diameters.

Straight edge of saw blade shows how hard-faced end of barrel has held its size.

Stoody Hard-Facing Alloys afford maximum protection to all wearing equipment. For recommended alloys and application technique on your specific wear problems refer to the Stoody Hard-Facing Guidebook. Your Stoody dealer has a copy for you or write direct.

Notice how hard-facing beads surround but do not cover diamond inserts.

STOODY COMPANY
11971 East Slauson Avenue
Whittier, California

See the STOODY EXHIBIT—WELDING SHOW Buffalo, N. Y., May 9-11.

SPECIFY

Brawny Brownie

STEEL-GRIP ROPE SLINGS FOR TOUGH JOBS!

Swaged steel sleeve positively secures the strand ends of a Flemish eye splice. This sling has advantages of higher rated capacities, all steel construction and elimination of dangerous protusions. STEEL-GRIP slings are available in 9 sizes.

SEND FOR THIS SLING CATALOG: 54 standard types described and illustrated. Capacity tables on each. For your copy write—

WIRE ROPE CORP. OF AMERICA
600 N. SECOND
ST. JOSEPH
MISSOURI

AD 101

John J. Forbes Retires As Mines Bureau Director After 40 Years of Service

John J. Forbes, director of the U. S. Bureau of Mines, retired after 40 years of federal service on November 30, 1955. President Eisenhower, Secretary of the Interior Douglas McKay, other Federal Government officials, and Bureau employees paid tribute to Mr. Forbes in special ceremonies.

John J. Forbes

Born at Shamokin, Pa., in 1885, Mr. Forbes spent most of his boyhood working in the anthracite coal region. After obtaining a teaching degree in 1905 from the State Normal School at Kutztown, Pa., he continued working and teaching before entering Pennsylvania State College, where he received a bachelor of science degree in mining in 1911.

Joining the Bureau of Mines in 1915, Mr. Forbes served in the various progressive grades of mining engineer before being appointed supervising engineer in July, 1927. He continued in that capacity until 1941, when he was named chief mine inspector for the Bureau to supervise activities under the newly authorized Federal Coal Mine Inspection and Investigations Act of 1941. He won wide recognition for his administration of the Bureau of Mines emergency wartime functions through the Mineral Production Security Division, created in 1942 to insure continued production of vital war materials.

Upon the conclusion of this program Mr. Forbes was advanced to assistant chief of the Health and Safety Branch, and again assumed supervision of the Coal Mine Inspection Division. Three years later he was appointed chief of the Health and Safety Division and continued in that position until his Presidential appointment as director of the Bureau in November, 1951.

Huron Portland Cement Co. Increases Lake Carrier Fleet

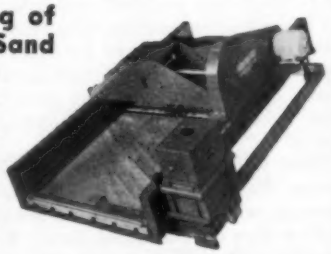
Officials of the Huron Portland Cement Company have announced the purchase of the *E. C. Collins*, a 440-ft. bulk ore carrier, from the Kinsman Transit Company, Cleveland, Ohio. The steamer was built in 1904 by the American Shipbuilding Company.

There is no present plan for reconstructing the *Collins* into a self-unloading cement carrier, according to Paul H. Townsend, president, although the steamer *Presque Isle*, purchased last year by Huron, is being converted at Sturgeon Bay, Wis., and will be ready to sail next spring. Purchase of the *Collins* brings the total number of ships owned by Huron to six.

New Economy in Screening of Lime, Ag-Lime and Silica Sand

Difficult screening of damp fines is now practically trouble-free and most economical with the Model E Leahy® Screen equipped with FlexElex heating of the jacket.

No other heated screen offers the performance of such wide-open mesh, complete elimination of flexible connectors, such convenient and rapid changing of jackets without make or break of electrical connections and such operating economy. Send for Bulletin 16-EH.



Made by the Original Deister Company Incorporated 1906

THE DEISTER CONCENTRATOR COMPANY
911 Glasgow Avenue, Fort Wayne, Indiana

MERCER-FRASER USES "CHEAPEST POSSIBLE METHOD OF HANDLING GRAVEL"

This new CAT* D8 Tractor, 'dozing river run gravel into a Kolman portable screen with 30-in. belt, keeps 30 trucks busy. The D8 with No. 8U Bulldozer, owned by Mercer-Fraser Co. of Eureka, Calif., is on the job 48 hours a week except when operations are flooded out by the Mad River.

"For this type of work, this new D8 is ideal. The U-type blade handles big loads, and the D8's ability to reverse fast saves time. This is the cheapest possible method of handling gravel. No wonder we're 100% Caterpillar owners," says Ralph W. Brown, president of Mercer-Fraser. The firm has five other Caterpillar track-type Tractors on this job, producing 2-in. screened gravel for a new four-lane freeway near Arcata, Calif.

The new Caterpillar D8 Tractor (Series D with torque converter, or Series E with exclusive oil clutch) is built to handle *more material* at *lower cost*. Its four-cycle, completely new Cat Diesel Engine develops 191 HP. It has new, easy-operating controls and "live-shaft drive" that lets you operate rear-mounted equipment regardless of the flywheel clutch position.

A full line of Caterpillar-built Bulldozer blades is available for the new D8. Their scientifically curved moldboards provide good shearing and fast-rolling loads, and their heavy-duty construction stands up to equipment-busting work around rock. Your Caterpillar Dealer – who provides fast service and dependable factory parts – will gladly demonstrate the new D8 Tractor. It can do the most work for *you* at the lowest cost. Call him today.

Caterpillar Tractor Co., Peoria, Ill., U. S. A.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

NAME THE DATE... YOUR DEALER WILL DEMONSTRATE

Some of the 25 Sly Dust Filters at Peerless Cement Corp., Detroit.

Peerless Performance at PEERLESS CEMENT

Complete reclamation of cement dust . . . clean, dust-free plant . . . important operating economies. These are three reasons why Peerless Cement Corp. uses Sly Dust Filters — and has done so since 1924. The reorders are justified by Sly performance. Today, in its Detroit plant, Peerless Cement has 25 Sly Filters in operation — actually 349 lineal feet of filter.

Because of the diversified Sly line, Peerless has the exact filter necessary for each specific operation. Expert filter design and construction mean **peerless** performance at every dust control point — with no appreciable maintenance.

Like Peerless Cement Corp., hundreds of cement plants choose Sly Dust Filters. They offer important advantages in greater filtering capacity, easier bag replacement, automatic control, space-saving installation, and other features that mean low-cost operation.

Sly's 82 years of dust control leadership are reflected by the experienced Sly engineer in your area. He will be glad to discuss your dust control problems with you. For immediate information, write for helpful, free bulletins.

SLY LINE-UP AT PEERLESS CEMENT

FINISH MILL VENTILATION—3 Dynaclones, 3 Automatic-Continuous Filters.

PACKHOUSE VENTILATION—5 Standard Filters, 1 UNIT Filter.

CEMENT SILO VENTILATION—4 Continuous-Automatic UNIT Filters.

BULK TRUCK LOADING—6 UNIT Filters.

JUNCTION HOUSE VENTILATION—(Belt Conveyor Transfer Point)—1 ECONOMY Filter.

PRIMARY GRINDING MILLS' VENTILATION—1 Automatic-Continuous Filter.

LABORATORY GRINDING EQUIPMENT VENTILATION—1 UNIT Filter.

Designers and Manufacturers of: Dust Control Systems, Blast Cleaning Equipment, Tumbling Mills, Industrial Ovens.

THE W. W. SLY MANUFACTURING CO.

SINCE 1874

4745 TRAIN AVENUE • CLEVELAND 1, OHIO

OFFICES IN PRINCIPAL CITIES

Lehigh Announces Purchase Of 2,000-Acre Tract To Insure Limestone Supply

Lehigh Portland Cement Company officials have announced the purchase of approximately 2,000 acres of high-calcium limestone west of Watertown, N. Y. The transaction was revealed in the 1955 annual report of the company. The tract is located within two miles of deep water in Lake Ontario.

In his report, President Joseph S. Young said: "Our Buffalo (N. Y.) plant has purchased its entire requirements for limestone from Alpena, Mich., ever since its inception. Because of the long haul, delivered costs, even by water, have been excessive.

"To guard against the possibility that some day we may no longer be able to justify the high delivered costs of Michigan stone, we have purchased this Watertown property."

Apart from its potential value as a future souce of limestone for Buffalo, Mr. Young added, this deposit is so extensive that it could also adquately supply all the raw material required for a cement manufacturing plant at that location.

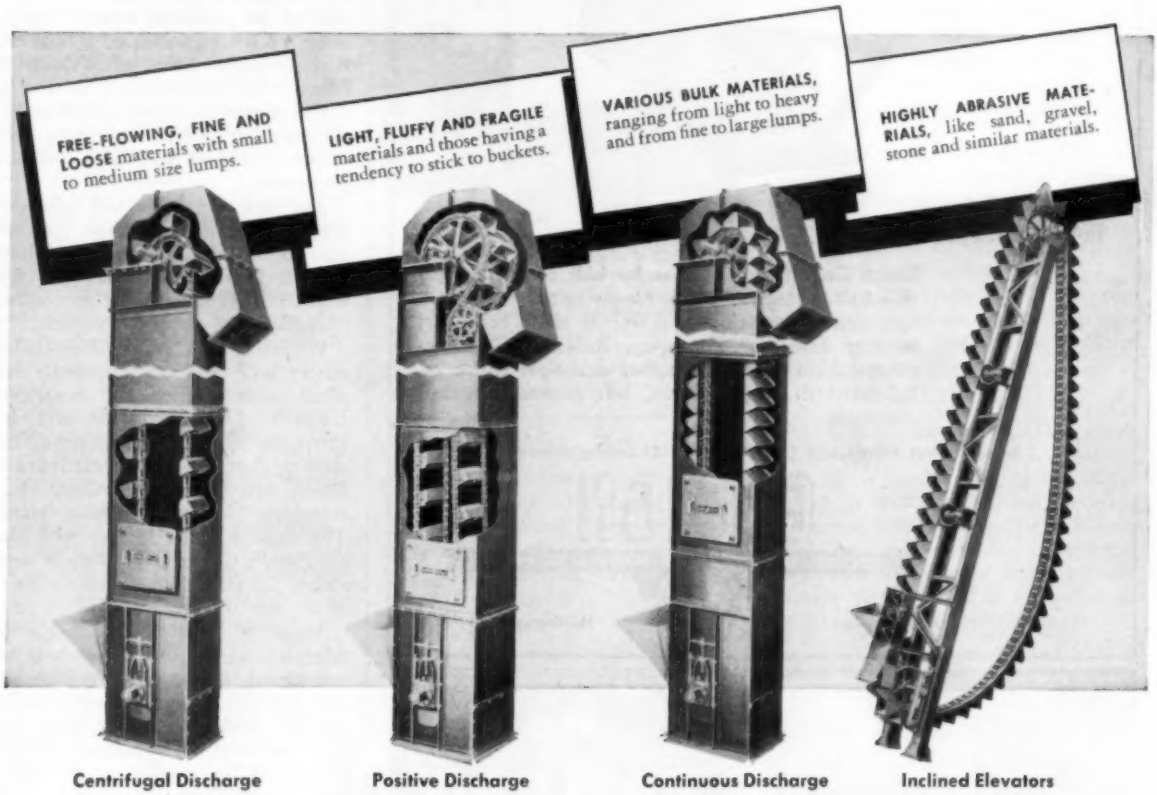
Jan. Building Activity Dips But Outstrips Jan., 1955

The value of new construction activity declined seasonally in January, 1956, to $2,850,000,000, but exceeded the previous January record set in 1955, by 1 percent, according to preliminary estimates prepared jointly by the U. S. Departments of Commerce and Labor. On a seasonally adjusted basis, outlays for new construction in January were at an annual rate of $41,500,000,000, compared with actual expenditures of $41,300,000,000 in 1955.

Private construction declined 12 percent in January, reflecting a slightly more than seasonal decrease in residential building. Industrial building continued the upward swing, which began in the fourth quarter of 1954, and established a new record for any month amounting to $228,000,000. Commercial building (offices and stores, etc.) declined 7 percent, but reached a new January high of $249,000,000, nearly one-third above expenditures in this category a year ago.

Public construction expenditures, in total, showed the normal overall seasonal decline of 6 percent. Nevertheless, new January highs were recorded in outlays for highways, public schools, and sewer and water projects.

LINK-BELT Bucket Elevators are tailored to suit your needs

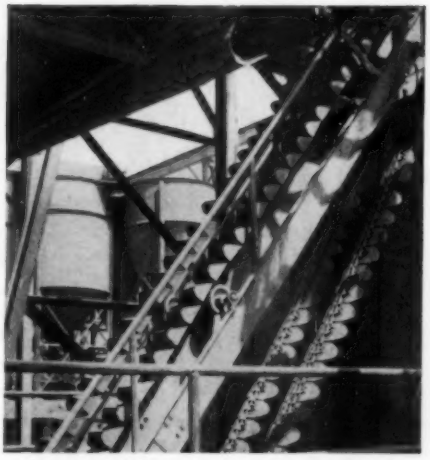

FREE-FLOWING, FINE AND LOOSE materials with small to medium size lumps.
LIGHT, FLUFFY AND FRAGILE materials and those having a tendency to stick to buckets.
VARIOUS BULK MATERIALS, ranging from light to heavy and from fine to large lumps.
HIGHLY ABRASIVE MATERIALS, like sand, gravel, stone and similar materials.
Centrifugal Discharge
Positive Discharge
Continuous Discharge
Inclined Elevators

What kind of materials must you elevate?

SELECTING the right elevator to handle your material is no cut-and-dried procedure, but it's easy when you depend on Link-Belt. For top efficiency, a number of needs must be considered: the right buckets, correct bucket spacing for clean pickup and discharge, the right takeup, and a correctly designed hood that prevents back-legging. Link-Belt's broad line of 13 elevator types in four basic designs—plus a wide selection of quality malleable iron, Promal, or steel buckets—assures the right elevator leg to suit your operations exactly.

This specialization also explains why it pays to call in Link-Belt when designing a new plant, so that all elevating requirements can be satisfied from the outset. Equally important, Link-Belt offers lowest-cost installation, operating and maintenance . . . stemming from advanced design.

Whether you handle large or small quantities, get the advice of a Link-Belt materials handling expert. Call the Link-Belt office nearest you.



Twin Link-Belt continuous discharge bucket elevators provide continuous flow of materials at this cement mill. Frames are of structural steel, and casings can be provided when desired.

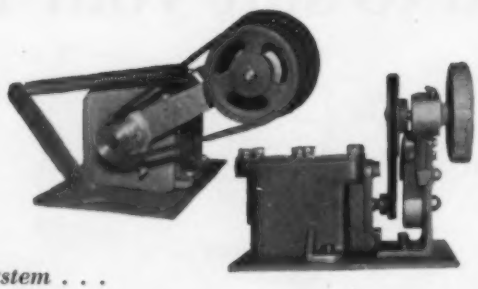
LINK-BELT

BUCKET ELEVATORS

13,757

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants and Sales Offices in All Principal Cities. Export Office, New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World.

ENSIGN CENTRIFUGAL SWITCHES



The Watchdog of Your Conveyor System . . .

Ensign Centrifugal Switches for belt conveyors provide belt protection and sequence operation of multiple conveyors including shaker or chain conveyors feeding onto belt conveyors. Bulletin 1100 Centrifugal Switch, left above, has dust-tight enclosure. Bulletin 1101, right above, has explosion-tested enclosure.

Request Ensign Bulletin 1100 (dust-tight) or 1101 (explosion-tested)

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the PAYLOAD BUCKET that outperforms them all

Regardless of the type of Page Automatic Bucket you buy—Lightweight, Medium Duty, Heavy Duty, Perforated or Slat—a Page is guaranteed to load faster and carry out more material than ordinary old style buckets.

When you want to move material profitably—and make certain that each load is a *payload,* be sure your bucket is a Page Automatic. Write for Bulletin GPB-454.

Page Automatic Buckets are made in capacities from ⅛ to 40 yds.

If it's a PAGE *...It* DIGS

BF-3200

Page ENGINEERING COMPANY
Clearing Post Office, Chicago 38, Ill.

Wyandotte Chemicals Plans $2,500,000 Expansion To Double Cement Output

A $2,500,000 expansion of its cement plant facilities that will double production and include the latest type of air pollution control equipment has been announced by Robert B. Semple, president of Wyandotte Chemicals Corporation. This firm is a major manufacturer of industrial chemicals—chlorine, soda ash, and caustic soda—as well as a cement producer.

The new expansion will raise the company's present cement production to nearly 2,500,000 bbl. annually, and ultimately increase the number of employees in its cement operations by about 20 percent.

Wyandotte's multimillion-dollar outlay will be used principally for plant modernization and expanded facilities. Over $500,000 will be spent for air pollution control, including electro-static precipitators which will virtually eliminate dust emissions from the cement plant. The installation is in line with the company's announced policy of providing for pollution control facilities in all new construction.

Work is scheduled to begin in March, and the first phase is to be completed by late summer. The initial step in the expansion, installation of modern clinker coolers and the extension of linings to the full length of the cement plant stacks, has already been completed. Construction of two new silos, additional cement conveyor systems, and expansion of bulk loading facilities are included in the expansion.

George W. Schwarz, vice-president and general manager of the company's General Products Division, stated that the new plant will produce a high-quality portland slag cement, an interground mixture of portland cement clinker and granulated blast-furnace slag. This product has been extensively used in Europe since 1892, but has only recently become available in the United States in any substantial tonnage. It is said to have many advantages over ordinary portland cement.

It has been announced that the 59th annual meeting of the American Society for Testing Materials will be held in Atlantic City, N. J., from June 17 to 22. The society's twelfth apparatus exhibit will be staged concurrently with this meeting. Headquarters will be the Chalfonte-Haddon Hall.

Natl. Gypsum Announces Progress of Construction At Westwego, La., Plant

The multimillion-dollar National Gypsum Company plant at Westwego, La., is nearing completion.

When completed in the spring, the plant will be able to produce enough gypsum building products for 50,000 homes annually. The shortage of gypsum building materials in the South is expected to be relieved substantially by the new mill's production.

The Westwego plant is part of National Gypsum's five-year, $75,000,000 expansion program. The company has three other plants under construction and is expanding four others. National Gypsum previously has revealed plans to build plants on the West Coast and in Canada.

Construction of the Westwego plant began several months ago. The first load of raw gypsum rock will be unloaded at the dock in March.

Canada Cement Company Limited, Montreal, Que., reported record net profits of $7,591,877 for the fiscal year ended November 30, 1955. The increase was attributed to reduced depreciation provisions. President J. M. Breen stated that all plants operated at capacity, while sales and production were "moderately" higher than in the previous year. Gross income was lower because of higher operating costs and reduced selling price of cement.

D. J. George (left), works manager of the United States Gypsum Company plant at New Braunfels, Tex., receives a Certificate of Achievement in Safety from Robert Boynton of Washington, D.C., general manager of the National Lime Association. The award enrolled the U.S.G. plant in "The Thousand Day Club of the Lime Industry". The plant had no lost-time injury to any employee from Nov. 28, 1952, forward.

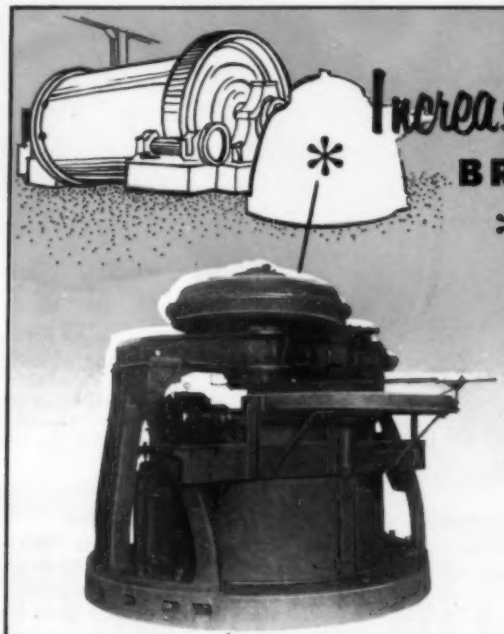
Texas Portland Cement Awards Erection Contract For Structural Equipment

Officials of the Texas Portland Cement Company, Orange, Tex., have announced that a $200,000 contract has been awarded to Erectors and Riggers, Inc., Houston, Tex., for handling all unloading and erection of the structural equipment for the firm's new cement plant, now under construction.

The Houston concern will be responsible for unloading and putting up the 10- by 300-ft. kiln, the clinker cooler, the tube mills, and all conveyors, structural steel, dust collectors, and air separators.

Texas Portland's 1,500-bbl. per day cement plant will utilize sea shells, gypsum, and clay to produce standard portland cement.

Fire swept through the Glenwood Stone Company recently, in Rochester, N. Y., razing two of the three buildings and causing damage estimated at $15,000. In addition to the building losses, 40 tons of marble dust and 20 tons of cement were ruined by water and fire. The cause of the fire was not determined.



Increased CEMENT PRODUCTION

BRADLEY HERCULES MILLS

* *as a preliminary pulverizer for compartment or tube mills.*

The quickest, most economical way to increase your grinding capacity

For the cement manufacturer with excess kiln capacity . . . here is the answer to INCREASED CAPACITIES at an appreciable SAVING IN HORSEPOWER. The Bradley Hercules Mill, used as a preliminary pulverizer, before compartment mills or tube mills, results in INCREASED PRODUCTION of finished material at a LOWER COST per barrel.

Rugged, dustless construction, maximum accessibility keep maintenance costs at an absolute minimum.

Automatic electrical feed control eliminates manual operation.

For complete information, write for Catalog No. 57

Bradley PULVERIZER CO.

LONDON ALLENTOWN, PENNA. BOSTON

NOW *bid beating... dirt heaping...* 1956

10% bigger payloads!

Model "75" ... boosted to 20 yds heaped (without sideboards) ... 262 hp.

Model "55" ... boosted to 14 yds heaped (without sideboards) ... 172 hp.

Wide-base tubeless tires and windshield, shown, available as optional equipment.

1 **Wider "Target" Push-Block** makes it easier to make and maintain contact. Helps to cut loading and cycle time.

2 **Straight-Line Ejector Reeving** requires minimum power; leaves more power on Payscraper wheels for faster dumping and spreading. Also speeds re-threading time.

3 **Sturdy Cover Plates** protect new, stronger cylindrical ram and air tanks.

4 **New, Straight-Back Bowl** lets you heap and haul more dirt every trip. Struck capacity, *with sideboards*. 18 cubic yds on "75"—12 cubic yds on "55".

5 **Higher Apron Lift,** bigger apron opening, provides cleaner, more rapid dumping, especially of "sticky" materials.

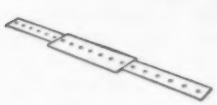
6 **Fast-Acting Apron,** arms mounted outside bowl, assure quick, positive closing of apron. Payscraper holds the load from cut to fill.

7 **Lowered Draft Frame** provides operator with "control tower" visibility of bowl and push-tractor ... also helps direct push and pull power more efficiently to cutting edge for faster loading.

8 **Larger, Wider Fenders** give greater safety for operator, greater protection for machine.

International Payscrapers®

Maximum 52° Oscillation
from right to left takes the stress and strain out of hauls over furrows, rough ground.



Adjustable 3-Piece Cutting Edge
for clean, fast cutting and loading under all soil conditions.

New, Long-Lasting Clutch
of ceramic material and powdered metals, successfully resists heat and wear over longer periods. Available on Model 75 only.

Put the 1956 International Payscraper to work on your job, and watch dirt boil up into its new, straight-back bowl. You've never seen any big scraper load as easily or as fast. In seconds, you've packed in up to 23 heaped yards. Its offset 3-section blade breaks the ground like a sharp-pointed spade. Dirt boils from the smooth-slicing cutting edge and fills the corners to build a full heaped load. Close the apron instantly, positively, on this huge, well-compacted load and you carry all the dirt you've heaped in.

Now, drive easily, effortlessly with safe hydraulic power steering at a fast clip to the fill. Note how the 1956 Payscraper's extremely high ratio of horsepower to capacity and its rapid acceleration to 24 mph top speed add up to more trips per hour than any other self-powered scraper you've ever used. Yes sir, it's a real profitable dirtmover, this 1956 Payscraper! Try one yourself on your job! See your International Industrial Power Distributor for a demonstration.

INTERNATIONAL HARVESTER

International Industrial Power

INTERNATIONAL HARVESTER COMPANY, 180 N. Michigan Avenue, Chicago 1, Illinois

A COMPLETE POWER PACKAGE INCLUDING: Crawler, Wheel, and Pipe-Boom Tractors . . . Self-Propelled Scrapers and Bottom-Dumps . . . Tractor and Rubber-Tired Loaders . . . Diesel and Carbureted Engines . . . Farm Machinery . . . Motor Trucks.

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OFFERS THE BEST
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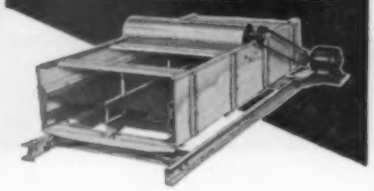
AT THE LOWEST PRICE



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There's a model to fit your particular requirement, priced within the smallest budget.

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SCREEN CO.
Racine, Wisconsin
Quality Screens Since 1919

IT COSTS NO MORE — TO USE THE BEST

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MANGANESE STEEL
Shovel Dippers
Dipper Teeth
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Bowl Liners
Roll Shells

Pulverizer Hammers
Grate Bars—Breaker Plates

Ball Mill Liners
Screen Plates

The Frog, Switch & Mfg. Co. CARLISLE, PA.
ESTABLISHED 1881

The circular vibrating screen installed at the Buffalo plant of the Penn-Dixie Cement Corporation. Minus 8-mesh clean clay slip is delivered to the storage tank at the left. Waste oversize is discharged by the spout at the right into a catch basin below.

Problem of Blinding Solved At Penn-Dixie Operation

At the Buffalo, N. Y., plant of the Penn-Dixie Cement Corporation (formerly Federal Portland Cement's plant) a single-deck Sweco separator was installed in the circuit recently to correct a troublesome problem involving the alumina raw-mix component, in this case a 40 to 60 percent moisture content clay slip.

Blinding had been a serious problem with the screen formerly used in attempting to eliminate lumps, pebbles, and foreign matter from the clay. The 8-mesh stainless steel screen deck in the Sweco separator is reported to be handling 400 g.p.m. of the slip without blinding. Retained solids, which are wasted, run about 1.4 lb. per 100 gal. of throughput.

More than 3,000,000 gal. of slip had been processed when the installation was observed.

The new sales offices of the Universal Atlas Cement Company were opened recently in Milwaukee, Wis., at 208 E. Wisconsin Ave.

Preliminary 1955 Report Of Ohio Mineral Output Records Increase of 13%

The value of Ohio mineral production rose 13 percent—from 261,978,000 in 1954 to $295,600,000 in 1955, according to estimates of the U. S. Bureau of Mines. The increase was due primarily to a 21 percent advance in bituminous coal output—from 30,150,000 tons produced in 1954 to 36,625,000 tons in 1955.

Output of natural gas and petroleum increased 49 percent and 11 percent, respectively, in 1955, as compared with the previous year. The state's quarries continued to produce sandstone and limestone at virtually the same rate as in 1954. Sand and gravel output rose 5 percent and output of clay and cement increased 19 percent and 5 percent, respectively, over 1954.

Two major ceramic plants were constructed in Ohio in 1955. These included the Belden Brick Company's $1,750,000 face brick and building tile plant near Sugar Creek and Kaiser Aluminum & Chemical Corporation's $4,000,000 basic refractory plant at Columbiana.

Bessemer Limestone & Cement Company broke ground during the year for a $3,500,000 cement plant near Youngstown, Ohio. It was anticipated that these facilities would be completed by May, 1956. Columbia Cement Division, Pittsburgh Plate Glass Company, announced plans for a 50 percent increase in capacity at its White Cottage, Ohio, plant. The company converted its East Fultonham limestone quarry to underground mining. Consolidated Cement Corporation started construction of a 1,250,000-bbl. cement plant near Paulding. Completion of this operation, which will be located on the site of the company's limestone quarry, was anticipated for the fall of 1956.

for a firm grip . . . demand Allied BULLDOG

Grip-Lug

TRACTOR GROUSER RETREAD
- EXCLUSIVE DESIGN
- INCREASED TRACTION
- RE-LUG WITHOUT DISMANTLING
- WORK-HARDENING STEEL
- SCIENTIFICALLY "WELD-METALIZED"
- ANY SIZE OR SHAPE

Also . . . Steel Plate, Grader Blades, Special Cutting Edges, Pneumatic Tools, Traffic Signs and Sign Posts, Gutter Broom Wire and Fibre Brooms.

Territory open for agents and dealers.
ALLIED STEEL & TRACTOR PRODUCTS INC.
7835 Broadway • Cleveland 5, Ohio • U.S.A.

look at this TSP trunnion

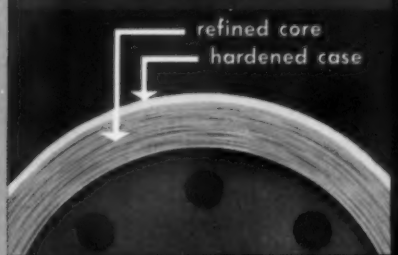
"Tool Steel Process" Trunnions have been in use since 1940 at a large Michigan Cement Co. All 4 kilns use a total of 18 "Tool Steel Process" Trunnions. None has worn out to date. In addition they have been instrumental in smoothing the surface of the large tires. We quote from a letter from this Company. "TSP Shafts installed with these TSP Trunnions show the same spectacular results. Former use of competitive shafts necessitated renewing bearings every two years."

It's no secret that hundreds of Companies replace original worn out parts with TSP hardened products. The tremendously increased life span, the dollar savings in "downtime," the increased efficiency of the machine as a whole, are just a few reasons for TSP popularity.

THE TOOL STEEL GEAR AND PINION CO.
CINCINNATI 16, OHIO, U. S. A.

AD No. 53-A

TSP products are hardened by our special process. The file hard surface to full depth of permissible wear gives maximum life. The core, refined for toughness and ductility, gives maximum strength.



TSP products are guaranteed to give longer life in the same service than any other product.

The Standard of Quality Since 1909 for Gears • Pinions • Rolls • Wheels and Other Hardened Products

B.F.Goodrich

All-Nylon Universal tires eliminate impact breaks for rock company

LONG ROCK COMPANY of Princeville, Illinois, has hauled thousands of tons of stone in the past few years from quarry to crusher to road-construction site. Trucks must travel over rock and rough roads—conditions that used to rip and tear tires and run up costs.

Then Long Rock switched to new B. F. Goodrich *all-nylon* Universal tires. "These tires," writes James Long, "have eliminated impact breaks and do a fine job of resisting cuts and abrasions. Our switch to your *all-nylon* Universal tires has saved us down-time and hundreds of dollars annually."

B. F. Goodrich Universal tires give such outstanding service because the tread is specially compounded to resist rock cuts. The *all-nylon* cord body withstands double the impact of ordinary materials, resists heat blowouts and flex breaks. No wonder the *all-nylon* body outwears even the extra-thick tread, *can still be recapped over and over!*

See your B. F. Goodrich retailer today and find out how you can get longer service at lower cost with B. F. Goodrich *all-nylon* Universal tires. Or write *The B. F. Goodrich Co., Tire & Equipment Div., Akron 18, Ohio.*

"WE WOULDN'T USE any tires in our operations that were not of B. F. Goodrich *all-nylon* construction," writes James Long.

UNITS of County Concrete, Inc., Newtown, Ohio, roll on such tires as the BFG *all-nylon* All-Purpose. All replacements are BFG.

Specify B. F. Goodrich tires when ordering new equipment

RESEARCH KEEPS B.F.Goodrich FIRST IN RUBBER

Your B. F. Goodrich retailer is listed under Tires in the Yellow Pages of your phone book

James G. Hansen Named To Works Manager's Post At New Permanente Plant

James G. Hansen has been appointed works manager for Permanente Cement Company's new $12,000,000 southern California cement plant including the quarry, which will produce both cement and steel-grade limestone at Cushenbury, in San Bernardino County, Calif. The announcement was released by Wallace A. Marsh, vice-president and general manager of Permanente. Mr. Hansen will report to John M. Garoutte, vice-president in charge of operations.

James G. Hansen

Construction of the new plant is proceeding rapidly, and Mr. Hansen will begin work immediately with the engineers and contractors in coordinating building activities with the quarry mining program. Quarry operation is scheduled to begin this fall. Grading of the plant site, under contract to Morrison-Knudsen Company, is well under way; and structural steel erection, under contract to the Fabricating Division, Kaiser Steel Corporation, will begin during the latter part of April.

The Atcheson, Topeka & Santa Fe Railway has started construction on the 32-mile branch line which will connect the plant with the main rail line near Hesperia, Calif. This line will transport the finished cement from the Cushenbury plant to the market, and also will be used to ship limestone to the Kaiser Steel Corporation plant at Fontana, Calif., for use in steel making.

Mr. Hansen was formerly manager of Kaiser Steel Corporation's iron ore mine at Eagle Mountain, Riverside County, Calif. Prior to joining Kaiser Steel, he was employed by the M. A. Hanna Company, in Michigan, the A. J. Boynton Company at Geneva, Utah, and other mining companies. He is a member of the American Institute of Mining and Metallurgical Engineers.

Mine in British Columbia Soon to Ship Out Asbestos

H. C. Hughes, chief inspector of mines for British Columbia, stated recently that a new road soon will allow the Cassiar asbestos mine in far northern British Columbia to market medium-grade asbestos ore.

Lack of access to the Pacific coast has limited development of the mine to high-grade ore, which now is transported along the Alaska highway to Skagway and by ship to Vancouver.

Mr. Hughes said the medium-grade ore will be produced economically when a new 300-mile road linking Cassiar with Stewart, 550 miles northwest of Vancouver, is completed.

Interior of a Hardinge 11½′ x 12′ Rod Mill with 85-ton rod load, 1000 horsepower.

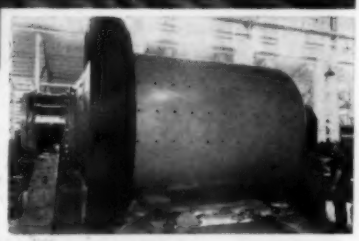
Hardinge
ROD MILLS

Sizes range from 2′ to 11½′ shell diameter and up to 1000 horsepower.

Types include trunnion overflow and peripheral discharge for both wet and dry grinding.

Applications include both open and closed circuit arrangements for ores, aggregates, concrete sand, cokes, and abrasives.

Complete specifications on request. Bulletin 25-C-8.



Trunnion overflow mill

End peripheral discharge mill

Center peripheral discharge mill

HARDINGE
COMPANY, INCORPORATED

YORK, PENNSYLVANIA • 240 Arch St. • Main Office and Works

New York • Toronto • Chicago • Hibbing • Houston • Salt Lake City • San Francisco

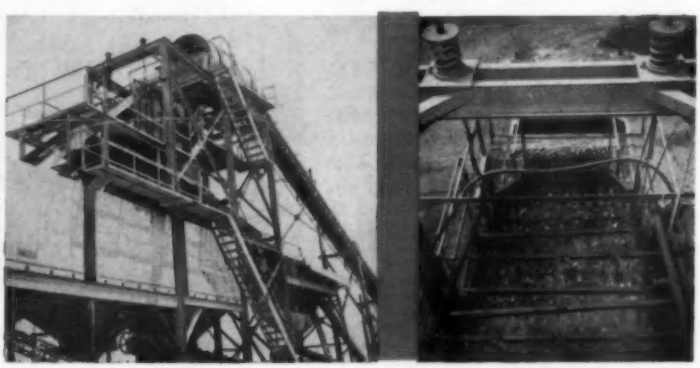
3,000 TONS OF

handled by a SIMPLICITY grizzly feeder at Badger Materials in Indiana

On the Indiana Turnpike, Badger Materials Co. is using a Simplicity Grizzly Feeder to handle 3,000 tons of aggregate a day, some of it well over 16 inches in diameter. This same material is being accurately sized by a Simplicity Simpli-Flo two bearing screen. A smooth operation throughout.

Start of the operation is shown here as a seven-yard truck dumps aggregate into a 25-yard receiving hopper. Feeding from this hopper is a Simplicity 3′ x 10′ OA-10-A2 Grizzly Feeder. The stone is fed off the grizzly bars and into a large gyratory crusher. The undersized material passes easily through the bars and onto a belt running under the crusher (the belt also receives crushed stone from the crusher). From here the material is fed into a plant which acts as a secondary crusher.

The material then travels up another belt, goes through a washer, and is discharged . . . onto a Simplicity 4′ x 12″ Simpli-Flo, 3-deck screen. Further washing is accomplished by spray bars on the Simpli-Flo, which is suspended by overhead springs and cables. The various sizes of material are dropped into hoppers and hauled away by trucks. Sand and undersized are sluiced off for separation.



171

AGGREGATE A DAY

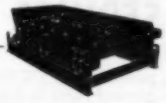
Simplicity Simpli-Flo Screens are two-bearing screens, generally hung by springs and cables from overhead supports. Simpli-Flo screens omit the usual main frame and outboard bearings, thereby offering minimum width for installations where width is a problem. On these double-end drive screens, the eccentric shaft is counter-balanced for efficient true circle operation; bearings are heavy duty eccentric type, protected against dust and water by labyrinth seals; discharge lips are readily accessible; and screen cloth is arranged for easy changing.

The Simplicity Grizzly Feeder combines scalping and feeding in one operation. This unit eliminates the old type arrangement of apron feeder and stationary grizzly. You will gain additional plant room. Your operating and maintenance costs will be cut by 50%. Simplicity Grizzly Feeders use an inertia type drive mechanism, and can produce heavy action, allowing sizes up to 6′ x 20′ and capacities up to 1,000 tons per hour. They maintain positive and controlled feed rates under the bin . . . bridging of material in the hopper is eliminated.

OTHER SIMPLICITY PRODUCTS INCLUDE:

- **Os-A-Veyor Feeders**

- **Simplicity Gyrating Horizontal Screens**



- **Simplicity 32 Series Balanced Conventional Pan Type Vibrating Conveyors**

- **Simplicity Woven Wire Screens . . . Send for Catalog No. 66**

SALES REPRESENTATIVES IN ALL PARTS OF THE U.S.A.

FOR CANADA: Simplicity Materials Handling Limited, Guelph, Ontario

FOR EXPORT: Brown and Sites, 50 Church St., New York 7, N. Y.

Simplicity
TRADE MARK REGISTERED

ENGINEERING COMPANY • DURAND 12, MICHIGAN

Mississippi Valley Portland Building 1,500-Bbl. Plant On 1,000-Acre Vicksburg Site

The Mississippi Valley Portland Cement Company will begin construction within 90 days of a $3,500,000 portland cement plant which will be located 10 miles north of Vicksburg on the Yazoo River. A site of over 1,000 acres rich in limestone and clay deposits has been purchased by the company.

President of the 1,500-bbl.-per-day plant is Kent B. Diehl Sr. of New York. Mr. Diehl, who has extensive interests in cement production in Texas and the East, is the inventor of the oil well cementing process now used throughout the world by the Halliburton Company.

A veteran of 37 seven years in the cement industry, Mr. Diehl is president of the Texas Portland Cement Company of Orange, Tex., and also has cement interests in Houston. For the last ten years he has been assistant to the president and consulting engineer for the Kennedy-Van Saun Manufacturing and Engineering Corporation of New York, designers and manufacturers of cement plant machinery. In that capacity he has designed and built cement plants in various parts of the world.

Mr. Diehl stated the plant site north of Vicksburg was selected after several years of study and analysis of stone deposits in that area.

"There are enough raw materials on the site to last a century or more," he declared, "and Vicksburg is strategically located to serve a rapidly expanding industrial area in the lower Mississippi Valley."

A railroad spur will serve the plant; and if future demand warrants, docks will be built on the adjacent Yazoo river. The site chosen for the plant is one which has often been considered by major cement companies for expansion. As long as 30 years ago studies were made of the huge limestone deposits. Mr. Diehl stated that chemical analyses had been made on borings from the property.

Although the plant will be rated at 1,500 bbl. a day and will employ approximately 100 workers, provision be made for eventual expansion to 4,500 bbl. daily. The plant is primarily designed to serve an area within a 100-mile radius of Vicksburg.

There is only one other cement plant in Mississippi at present. The Mississippi Valley Portland Cement Co. plant will be the only one in the state manufacturing the cement used in setting oil well casings.

Death of Hugo E. Koch Ends 40 Years of Service

Hugo E. Koch, for the last 12 years chief chemist and inspector at the Hannibal, Mo., plant of Universal Atlas Cement Company, who would have completed 40 years of service at the same location as of June 1, died of a heart attack at his Hannibal residence on February 13.

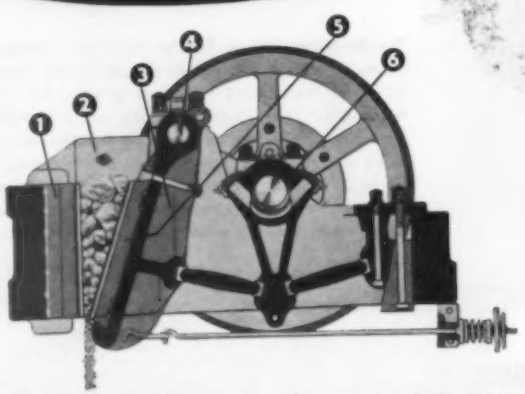
Mr. Koch was born in St. Louis, Mo., and attended the Missouri School of Mines at Rolla, Mo. Upon graduation from M.S.M. in 1916, he joined Universal Atlas at Hannibal as a chemist.

In 1919 he returned to Hannibal and was promoted, successively, to chemist foreman in 1923, chief chemist in 1928, and chief chemist and inspector in 1944.

The retirement of RAYMOND E. GRIFFITH, formerly vice-president in charge of refractory sales and engineering for E. J. Lavino and Company, Philadelphia, was announced recently. Mr. Griffith will continue to serve on the board of directors.

GAYLORD T. STOWE, who was assistant vice-president, was elected to succeed Mr. Griffith.

FARREL-BACON JAW CRUSHERS



DESIGNED FOR *at least* 50 YEARS OF SEVERE CRUSHING SERVICE

The frame of a Farrel-Bacon jaw crusher is cast in one piece from Meehanite® metal to take the shock of prolonged and severe crushing service. At points of wear this frame is protected by parts which absorb any wear that might occur, and can be easily replaced at minimum cost.

Some of the places at which wear has been "designed out" are: (1) ROUND BACK—provides a machined seat for the fixed jaw plate and prevents damage to the main frame. (2) CHEEK PLATES—protect frame sides; made in two pieces for economical replacement. (3) FALSE CHEEK PLATES—hold cheek plates, and prevent wear on frame at this point. (4) SWING JAW SHAFT—pinned rigid in frame bearing to prevent wear on frame casting.

Many of the working parts are preserved similarly. The swing jaw has a replaceable wearing plate (5), and the main bearings (6) can be easily removed and rebabbitted in the shop.

Farrel-Bacon can help you lay out your plant as well as supply all necessary equipment from primary crusher to bin gate. Write for further details.

FARREL-BACON
Ansonia, Connecticut
BA-6

35 years of dependable equipment performance with **GULF FUELS** and **LUBRICANTS** on the job *at the Warner Co., Devault, Pa.*

Gulf lubricants and fuels have been on the job for over 35 years at the Warner Company—helping to keep equipment "up," maintenance costs down.

One of Gulf's E.P. Lubricants contributes to longer life for kiln reduction gears; Gulf Dieselube H.D. provides efficient, economical lubrication for Diesel engines in trucks and shovels; and Gulf fuels contribute to top engine performance.

Let a Gulf Sales Engineer help you find opportunities for important savings through the use of Gulf Quality Lubricants and Fuels on your equipment.

Consult the telephone directory for the number of your local Gulf office.

GULF

Gulf Oil Corporation • Gulf Refining Company
1822 Gulf Building, Pittsburgh 30, Pa.

THE FINEST PETROLEUM PRODUCTS FOR ALL YOUR NEEDS

"THIS LUBRICANT KEPT 'EM ROLLING IN MUD, MUCK AND WATER"

—says J. O. ARCHIBALD
of Redwood City, California

The job was clearing 500 acres of salt marsh for crystallizing ponds. To quote, "We selected LUBRIPLATE No. 107 for track and general lubrication and LUBRIPLATE APG-140 for transmissions and final drives. During the entire job there was no replacements of track rollers nor any tie-ups of equipment due to parts replacement or breakage!"

REGARDLESS OF THE SIZE AND TYPE OF YOUR MACHINERY, LUBRIPLATE LUBRICANTS WILL IMPROVE ITS OPERATION AND REDUCE MAINTENANCE

LUBRIPLATE LUBRICATION MAKES CARS AND TRUCKS RUN BETTER AND LAST LONGER

LUBRIPLATE H.D.S. MOTOR OIL . . . THE OIL THAT NEEDS NO ADDITIVES

For nearest LUBRIPLATE distributor see Classified Telephone Directory. Send for free "LUBRIPLATE DATA BOOK" . . . a valuable treatise on lubrication. Write LUBRIPLATE DIVISION, Fiske Brothers Refining Co., Newark 5, N. J. or Toledo 5, Ohio.

Highway Research Board Honors Stanton Walker With Roy Crum Award

On January 17, 1956, the Highway Research Board of the National Academy of Sciences, National Research Council, conferred on Stanton Walker, director of engineering of the National Sand and Gravel Association, the Roy W. Crum Award for Distinguished Service. The citation reads as follows:

Hanton Walker

"The Highway Research Board has chosen Stanton Walker to receive its annual Roy W. Crum Award for Distinguished Service in recognition of his outstanding accomplishments in the fields of concrete and aggregates, where he has been prominent in research, education and the development of specifications and test methods. Mr. Walker has been active in the development of concrete technology for approximately 40 years. He began his career as a research assistant at the University of Illinois, where he was graduated in 1917. He was assistant and associate research engineer in the Structural Materials Research Laboratory of the Lewis Institute, Chicago, from 1917 to 1926. The lasting value of the research conducted during this period is well known. Of special significance was development of the water-cement ratio and fineness modulus theories of concrete proportioning, still applicable and in general use today.

"In 1926 Mr. Walker became director of engineering of the National Sand and Gravel Association, in which capacity he still serves. He has also been director of engineering of the National Ready Mixed Concrete Association since its organization in 1930. He directs the associations' research activities at the University of Maryland, where he has been a member of the faculty, as lecturer on materials, since 1938. He is also consulting engineer for the National Industrial Sand Association.

"He has been a member of the American Society for Testing Materials for over 35 years, during which time he served for 15 years as secretary of the Committee on Concrete and Concrete Aggregates. He is currently chairman of Group III Subcommittees on Specifications and Test Methods and is active on many other A.S.T.M. committees and subcommittees. He was a member of the society's board of directors from 1940 to 1942 and 1951 to 1954.

"He is a past president of the American Concrete Institute, has served as chairman of its Advisory Committee, and has been a member of the Standards, Publications, and Technical Activities committees. He was a member of the board of directors of that organization from 1940 to 1950.

"He was chairman of the Highway Research Board in 1944-45 and a member of the executive committee from 1941 to 1949. He has been prominent in the work of its Department of Materials and Construction, where he has held membership on such committees as mineral aggregates, air entrainment, durability, and dynamic testing. Other affiliations include the American Society of Civil Engineers, the American Railway Engineering Association, the American Institute of Mining and Metallurgical Engineers, and the Washington Society of Professional Engineers.

"Mr. Walker's contributions to the advancement of concrete and aggregate technology have been reflected in scores of papers and reports of the many engineering organizations in which he has served and of the associations for which he directs engineering activities. Of particular significance in the highway field have been extensive studies of concrete durability as related to materials, proportions, and air entrainment. The development of rational procedures for establishing concrete proportions has also advanced the utility and serviceability of concrete highways.

"The record of Stanton Walker is one of distinguished public service in the search for and the application of scientific knowledge."

Technical Problems Discussed At Expanded Clay-Shale Meeting

Officers of the Expanded Clay and Shale Association, Inc., left to right: T. R. Berger, Allentown, Pa., executive secretary; W. F. Atkins, Lansford, Pa., president; R. A. Utiger, Denver, Colo., vice-president; and Ron G. Hardy, Warners, N.Y., secretary-treasurer.

THE annual meeting of The Expanded Clay and Shale Association was held in The Roosevelt Hotel, New Orleans, on January 24, in conjunction with the recent N.C.M.A. convention. An intensified research program aimed at broadening information on expanded clay and shale aggregates was approved at this meeting.

The Technical Problems Committee, H. O. Pommer of Memphis, Tenn., chairman, was authorized to carry out plans to develop additional data on aggregates. This program will involve co-operation with aggregate producers in various geographical areas of the United States and in other countries, including England and Canada.

The association elected the following officers to serve in 1956: William F. Atkins, Lansford, Pa., president; R. A. Utiger, Denver, Colo., vice-president; and Ron G. Hardy, Warners, N. Y., secretary-treasurer. T. R. Berger, Allentown, Pa., was re-elected executive secretary.

The association accepted an invitation from the Onondaga Brick Corporation to hold its mid-year meeting at Syracuse, N. Y., the week of June 18.

In his annual report T. R. Berger, executive secretary, stated that 1955 had been a year of achievement for the association. He indicated that there is an urgent need to assemble technical information about expanded clays and shales, to put this into printed form at reasonable cost, and to disseminate it to the various areas served by the producer-members of the association. He also urged that the great interest in expanded clays and shales be converted into action by a well-integrated program of public relations and promotion.

Mr. Berger stated further that there is a continuing wish for exchange of information among the producer-members of the association on new ways of solving production and marketing problems, with resultant savings and increased efficiency.

Natl. Safety Council Issues New, Enlarged Safety Manual

A new and greatly expanded edition of the National Safety Council's *Accident Prevention Manual for Industrial Operations* has been announced by that organization. This third edition of the *Manual*, designed as "a basic text for the safety man's shelf", includes all necessary information for organizing and maintaining a comprehensive safety program. There are also many informative sections covering specific types of hazards encountered in various industrial operations.

This 1341-page volume may be obtained from the National Safety Council, 425 N. Michigan Avenue, Chicago 11, Ill., for $13.50.

Mineral Collectors Requested To Aid Ohio Mineral Survey

John H. Melvin, chief, Division of Geological Survey, Department of Natural Resources, has announced the beginning of a survey of the mineral collecting localities of Ohio. This project is directed toward the study of mineral occurrences where the amateur mineral hobbyist can find collection quality stones.

The Survey is asking all those willing to assist in this project by sending in information for Survey files (credit will be given to the source of information) to write to the Division of Geological Survey, Room 106, Orton Hall, the Ohio State University, Columbus 10, Ohio.

EDWARD C. FLIERL, 82, who served as secretary-treasurer of the old Carroll Brothers Sand & Gravel Company, Buffalo, N. Y., before his retirement, died on February 17 in a Buffalo hospital.

Use REMA to add years of life to your Belts

REMA is the New and Amazing Self-Vulcanizing Rubber Repair Material

REMA REQUIRES
- NO HEAT
- NO HEAVY EQUIPMENT
- NO CURING TIME DELAY

• REMA is not just another cold patch. REMA is vulcanization by chemical process. The repaired area is sealed with an abrasive resistant cover stock patch. No heat or heavy vulcanizing equipment required. Here's the astonishing advantage—*when repair work is completed belts may be returned to service immediately.*

• REMA seals out moisture, reduces mildew, rot and deterioration — the great enemies of conveyor belts. Your own maintenance man can quickly repair your belt — it doesn't take a skilled belt mechanic to use REMA.

• Used for repair of all types of damaged spots, edge wear and for covering metallic joints. Available in introductory kits or parts separately.

Order from your Flexco-Alligator distributor

Write for Folder No. R4

FLEXIBLE STEEL LACING CO.

4623 Lexington St., Chicago 44, Ill.

REMA SELF-VULCANIZING RUBBER REPAIR MATERIALS

Check

PRICE PER POUND OF LIFT CAPACITY

Here is a sound way to measure the value of excavators and cranes. Compare machines on the basis of price per pound of lifting capacity. You'll very quickly learn which machine offers you the biggest production capacity per dollar of equipment investment.

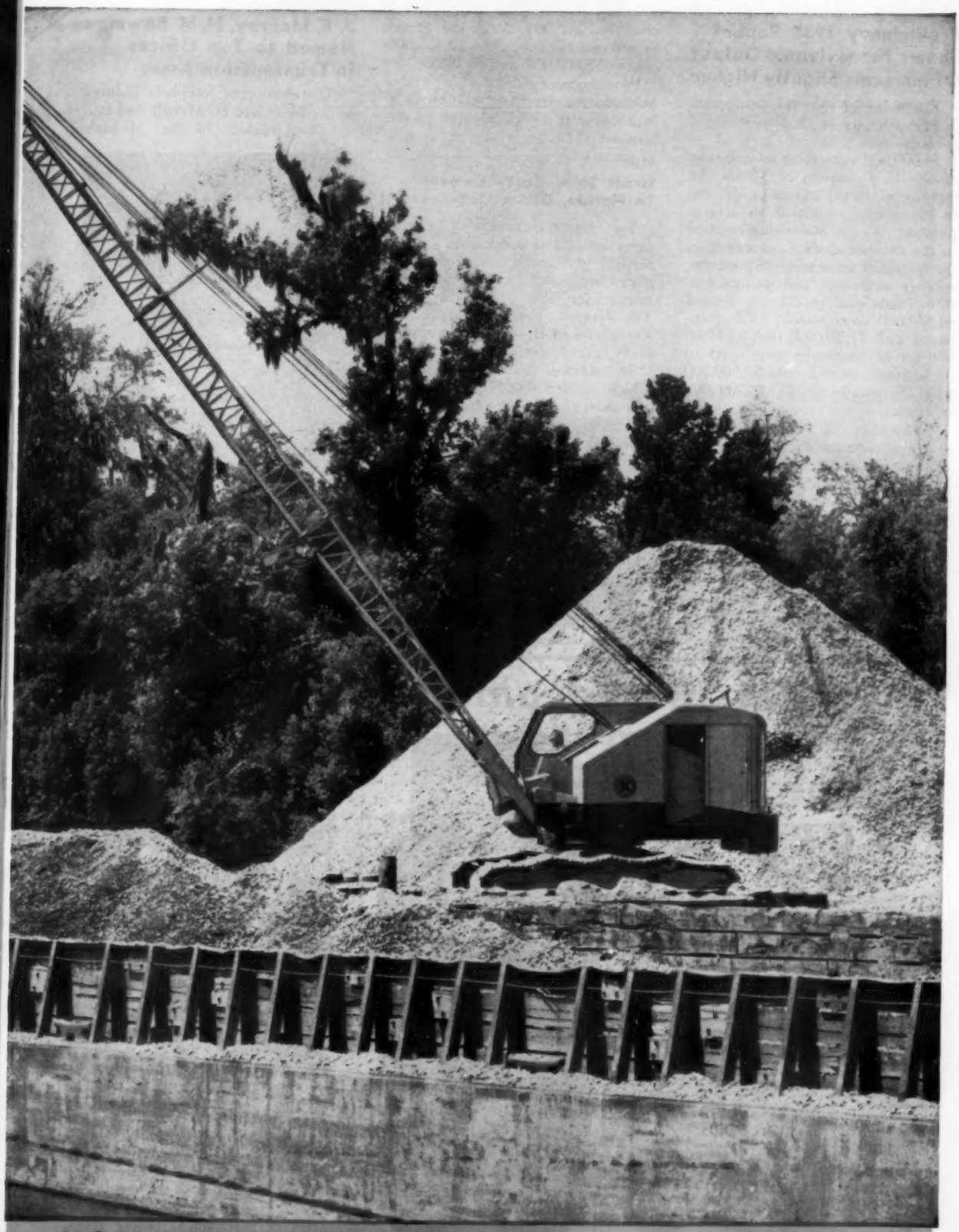
Remember — lift capacity is *work capacity*. Obviously, the machine with heaviest lift rating not only picks up larger crane loads. It also has more strength, speed and stability with every excavator attachment to handle bigger loads on a faster operating cycle.

Check the Koehring lift ratings shown below — then ask your Koehring distributor to give you the figures on price per pound of lift capacity.

compare for yourself:

KOEHRING MODEL	SIZE DIPPER	KOEHRING LIFT CAPACITIES (Crawler ratings based on 75% of tipping load. Rubber-tired machines — 85% of tipping load)		PRICE PER POUND OF LIFT CAP.*
205 CRAWLER	½-Yd.	20,000 lbs.	30-foot boom at 10-ft. radius	?
205 ON RUBBER	½-Yd.	30,000 lbs.	25-foot boom at 12-ft. radius	?
304 CRAWLER	¾-Yd.	27,800 lbs.	35-foot boom at 12-ft. radius	?
304 ON RUBBER	¾-Yd.	30,000 lbs.	30-foot boom at 10-ft. radius	?
405 CRAWLER	1-Yd.	40,000 lbs.	40-foot boom at 12-ft. radius	?
605 CRAWLER	1½-Yds.	72,300 lbs.	50-foot boom at 12-ft. radius	?
1005 CRAWLER	2½-Yds.	159,000 lbs.	50-foot boom at 12-ft. radius	?

Figures available on request—ask your Koehring distributor to see them.



KOEHRING COMPANY Milwaukee 16, Wis. *Subsidiaries:* JOHNSON PARSONS • KWIK-MIX

Preliminary 1955 Report Shows Pennsylvania Output Of Minerals Slightly Higher

The value of mineral production in Pennsylvania in 1955 increased 3 percent over 1954 to a total of $924,000,000 according to estimates of the U. S. Bureau of Mines. An increase of 19 percent in production of bituminous coal and an accompanying rise in total value resulted in the increase despite reductions in the output of some mineral products, notably anthracite and natural gas. Bituminous coal production totaled 84,880,000 short tons in 1955, compared with 71,550,000 tons in 1954. Output of anthracite continued to decline and totaled only 25,500,000 tons, compared with 27,118,000 tons in 1954.

Pennsylvania in 1955 continued as a leading national source of cement, lime, and clay. Cement production increased 4 percent, compared with the previous year, and lime and clay output rose 20 percent and 4 percent, respectively. The quarries of the state continued to yield limestone, sandstone, granite, basalt, and miscellaneous stone. Output comprised 34,000,000 tons and represented a 9 percent decline from the 37,171,187 tons produced in 1954. Sand and gravel production declined from 12,426,803 tons to 12,000,000 tons in 1955.

Production of sericite schist, a talc-like mineral, increased substantially in 1955 with the completion of the Summit Mining Company's new grinding mill near York Springs.

Israel Ships Carry Cement To Florida, Cuban Consumers

Two more shiploads of cement from Israel for builders in Florida arrived in Tampa and Port Everglades recently to fill increasing demands for this commodity. The *S.S. Tappuz,* proceeded from Port Everglades to Havana, to unload Israel's first cement shipment to Cuba.

In addition to the *S.S. Tappuz,* which carried 6,000 tons, the *S.S. Abraham Graetz* unloaded 8,000 tons at Tampa for the Tampa Sand and Material Corporation. This company had received a shipment of Israel cement last November. A part of the consignment (3,700 tons) of the *S.S. Tappuz* went to Maule Industries, Miami.

The new national headquarters of the Producers' Council, Inc., were established on February 27 at 2029 K Street, N.W., Washington 6, D. C.

J. E. Maurey, H. M. Bowman Named to Top Offices In Transmission Assn.

The election of Joseph E. Maurey as president and H. Merrill Bowman as vice-president of the Multiple

Joseph E. Maurey

V-Belt Drive & Mechanical Power Transmission Association, Chicago, has been announced by that organization.

Mr. Maurey is vice-president and general manager of the Maurey

H. M. Bowman

Manufacturing Corporation, Chicago, and Mr. Bowman is vice-president of The American Pulley Company, Philadelphia. The association which they will serve as top officers is comprised of American manufacturers of mechanical power transmission equipment, including sheaves, flat pulleys, and pillow blocks.

✓...check the advantages

for the

"Cape Ann"

FORGED

STEEL DROP BALL

✓ SPECIALLY DESIGNED

✓ GREATER IMPACT

✓ ECONOMICAL

2000 to 12000 lbs.

Budget-minded quarrymen specify the "Cape Ann" Drop Ball to insure record rock-breaking efficiency. Equipped with a forged connecting link, protected by a deep recess, adaptable for swivel or shackle. Strong alloy steel pin. Low cable replacements. Furnished complete as shown.

Write Today for full details

Cape Ann Anchor & Forge Co.

Gloucester • Massachusetts

One of the many Barber-Greene BatchOmatic Asphalt Plants setting new low cost production records in the United States and Canada.

Now . . . two, four and six thousand pound Barber-Greene BatchOmatic plants

Less than a year ago Barber-Greene introduced the revolutionary BatchOmatic—the first plant ever designed from its original conception for completely automatic operation. In that short time the success of this batch plant has been established all over the United States and Canada. Owners and operators everywhere report that the automatic operation has reduced their costs, increased production and expanded their market. Inspectors find that the BatchOmatic consistently produces mixes to specification with automatic accuracy.

Now the Barber-Greene BatchOmatic is available in three sizes: two, four and six thousand pounds.

Now you can choose the capacity that best meets your needs and get the money-making design features that lead the field . . .

Simultaneous weighing of all sizes of aggregate . . . to eliminate the human element in achieving accuracy and maximum capacity.

Instant change-over from automatic to manual operation . . . to provide mixes for the drive-in trade . . . instantly reset to preset repetitive cycle operation.

New Dyna-Mix pugmill . . . to give more thorough coating in less time than any other pugmill.

Instant, positive inspection of aggregate gradation and weight.

56-1-WB

Write for your copy of "Principles of the BatchOmatic"—clearly illustrated

Barber-Greene BG

AURORA, ILLINOIS, U.S.A.

CONVEYORS . . . LOADERS . . . DITCHERS . . . ASPHALT PAVING EQUIPMENT

F-100 8-ft. Pickup—GVW 5,000 lbs.

T-800—GVW 42,000 lbs.; GCW 65,000 lbs.

Ford saves you money with

YOU SAVE ON PARTS REPLACEMENTS—*add miles to engine life!*

YOU SAVE ON SHOP LABOR—*cut maintenance to the bone!*

YOU SAVE ON YOUR ORIGINAL INVESTMENT—*get more work done per truck!*

Ford Trucks for '56 save you money right from the start. And, they keep on saving with their extra-sturdy, long-life engine design.

For instance . . . Ford Engineers have now introduced into all heavy-duty engines the greatest valve advancements ever. As an example, see the exhaust valve in diagram on right page. The valve stem is hollow and partially filled with powdered sodium. When the sodium gets hot, it *turns into a liquid.* As it moves up and down, it carries heat away from valve head—*allows it to operate up to 225° cooler!* Result: a cleaner-running, more burn-free, longer-lived valve face.

Ford's long-lasting engine design pays off for you in every way. You save money on parts replacements such as piston rings and bearings. You save on shop labor—extend time between preventive maintenance jobs like valve adjustments, valve grindings, compression tests, ring jobs and the like.

And you can save on driver costs if you can keep trucks out of the shop and on the road. Yes, you save in every way when you get more work done per truck!

There's a Ford Truck for every trucking job. Before you buy your next truck, Test Drive a Ford Economy Truck.

FORD TRUCKS LAST LONGER

Certified by independent insurance actuaries for the ninth consecutive year! Studies of over 10,068,600 current license registrations show that Ford Trucks last up to 9.9% longer than any of the other 4 leading truck makes!

F-900—GVW 29,000 lbs.; GCW 60,000 lbs.

new long-life engine design

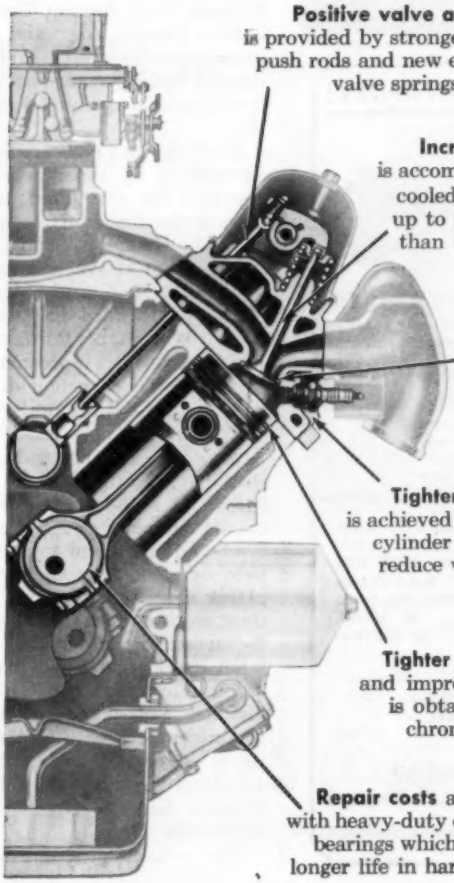
Hauls up to 3000 lbs. more than other 6-wheelers—New Ford T-800

● New power and hauling capacity of the Ford Tandem BIG JOB cuts hauling time on every run—makes giant cargos seem lightweight. You have a choice of two gas-saving Short Stroke engines. Either the 190-h.p. *Torque King* V-8 or, the 200-h.p. *Torque King* Special V-8.

You have new engine advancements for longer life (some explained and illustrated at the right).

New high-capacity tubeless tires, heavy-duty 5-speed transmission and Power Steering are standard equipment, at no extra cost. Two 3-speed auxiliary transmissions and full-air brakes are available at low extra cost.

New *Driverized* Cabs for driving comfort and convenience have *Lifeguard* Design safety features found in no other truck. Lifeguard steering wheel helps protect driver from steering column; Lifeguard door latches help keep doors from jarring open in case of accident.



Positive valve action is provided by stronger, tubular push rods and new equal-coil valve springs.

Increased valve life is accomplished with sodium-cooled exhaust valves—up to 225° cooler-running than solid-stem valves.

Longer valve and seat life are the result of solid tungsten-cobalt alloy facings and exhaust valve seat inserts.

Tighter valve closing is achieved with stress-relieved cylinder heads that help reduce valve distortion.

Tighter compression seal and improved ring durability is obtained with thicker chrome-plated rings.

Repair costs are lower with heavy-duty copper-lead bearings which provide longer life in hard service.

98 USERS IN 100 say GILSON IS FOR YOU!

The GILSON Screen

is designed for quick, accurate size-testing of crushed stone, gravel, slag, coal, ores, and similar materials. It handles up to one cubic foot of sample, makes seven separations simultaneously in five minutes or less.

A questionnaire to GILSON users, many of them owners of several screen units, showed that 97.5% not only approved GILSON, but recommended it to others. The remaining 2½% includes 1% who found GILSON performance satisfactory but reserved recommendation, and 1% with no comment.

GILSON users cut costs, increase profits by avoiding guesswork and error in meeting sizing specifications.

87.1% of GILSON owners reported maintenance "normal" or "light." Of these units in use at least 3 years and up to 14 years, 32.3% report *no maintenance* except lubrication!

Write for information and prices NOW!

A Sand Attachment for handling 8-inch sieves is optional equipment.

GILSON SCREEN CO.
MALINTA, OHIO

YOUR OPPORTUNITY!

UNUSED Army Trucks
2½, 3½, 5-ton

GMC-DIAMOND T & INTERNATIONAL 6x6's

- From Government Storage!
- Unused and Guaranteed!
- Factory-New Condition!
- Delivered on Approval!
- Reconditioned Trucks Also Available!

Tandem axle trucks with front wheel drive, 10 forward speeds, overdrive, brand-new mud and snow tires. Carry maximum loads, give extra power you need in "rough going" . . . at LESS, often half the COST of conventional new trucks.

For Specifications, Prices, Delivery:

Phone Collect
MILTON Y. TOOMBS, Jr.
Sales Manager

MEMPHIS EQUIPMENT Company
CONSTRUCTION AND AUTOMOTIVE EQUIPMENT AND PARTS
766 SO. THIRD ST. MEMPHIS, TENNESSEE

30 Years Ago in Pit and Quarry

By WALTER E. TRAUFFER

THE March 1 and 15, 1926, issues of PIT AND QUARRY contained a wide variety of articles on many different industries, including several which were, perhaps, a little ahead of their time. One editorial dealt with industrial pensions and the trend toward them in these industries. An article by Paul C. Cunnick, director of laboratories, Rock Island Arsenal, Rock Island, Ill., described the *Effect of Lime on Concrete Products*. This study gave conclusive evidence that the addition of lime improved the quality of concrete blocks and gave a higher yield.

Plant operating articles covered a wide range, including the marble finishing mill of the Vermont Marble Company at West Rutland, Vt.; the granite finishing mill of the Woodbury Granite Company at Bethel, Vt.; the rock asphalt plant of the Alabama Rock Asphalt Company in Colbert County, Ala.; and the slate quarry and finishing plants of the Eureka Slate Quarry and the Penrhyn Slate Company at Fair Haven, Vt.

The sand and gravel industry was represented by three articles. One described the river dredging operations of the Columbia Digger Company, the Columbia Sand Company, the Portland Gravel Company, and the Willamette Gravel Company, all owned by Howard F. Puariea and H. P. Warren of Portland, Oreg. These companies operated, respectively, two sand suction dredges on the Columbia River and two clamshell dredges on the Willamette River. All crushing and screening was done on the dredges, and delivery was by barge to yards owned by the company or its customers.

The Granite Sand & Gravel Company operated four sand and gravel plants near Indianapolis. Three of these worked from the same deposit. A suction dredge loaded the material into barges which transported it to an underwater storage pile. Individual Sauerman slackline cableway excavators fed from there to the three screening plants. Another scraper-fed plant was that of the Western Sand & Gravel Company at Westfir, Oreg.

The rehabilitated crushed stone plant of the Wauwatosa Stone Company, Wauwatosa, Wis., the black rock plant of the Jointa Lime Company, Glens Falls, N. Y., and the new plant of the New Braunfels Limestone Company, New Braunfels, Tex., represented the crushed stone industry. The last-mentioned plant was a 50-t.p.h. operation which featured hand loading as labor was then cheap in that area. Slag was represented by the Philadelphia Slag Company's plant at Swedeland, Pa., and ready-mixed concrete by the new central-mixing plant of the Pre-Mixed Concrete Company, San Diego, Calif. Deliveries were made in dump trucks.

Special articles included the following: *Physical Chemistry of the Calcium Sulphate, and Gypsum Reserves* by Oliver Bowles and Marie Farnsworth of the Bureau of Mines; *Measurement of Accident Prevention by Compensation Insurance Rates* by Byron O. Pickard of the Bureau of Mines; *Some Quarry Blasting Suggestions* by A. O. Deringer; and *Requirements of Liquid Oxygen Explosives.*

In the news was a progress story on the 1,500,000-bbl. cement plant then being built at Tampa, Fla., by the Florida Portland Cement Company. The Dewey Portland Cement Company announced plans for a 2-kiln wet-process plant near Davenport, Iowa. There was an official announcement of the appointment of Vincent P. Ahearn as active executive secretary of the National Sand and Gravel Association. Mr. Ahearn came to the association in March, 1921, as assistant executive secretary. There was also an announcement of the resignation of R. C. Newhouse as chief engineer of the Crushing and Cement Machinery Department of the Allis-Chalmers Mfg. Co. At this time he became vice-president and manager of the engineering department of the Cowham Engineering Company of Chicago.

GEORGE J. WHELAN, 82, retired president of the Kelly Island Lime and Transport Company, Cleveland, Ohio, died in St. Petersburg, Fla., where he had lived for the last six years.

Shovel has gone 20,000 hours without major overhaul using Cities Service C-300 Motor Oil

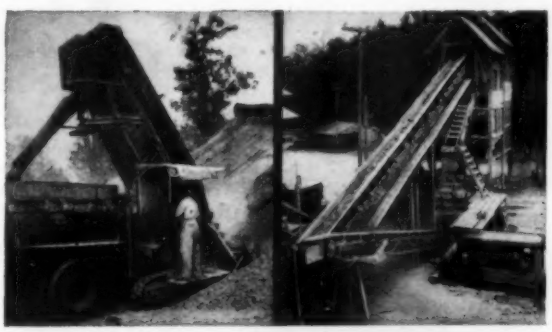
Helping Collinson Stone Company to produce better than ¼ million tons of limestone products per year, the Northwest shovel, pictured above, rarely gets a rest.

For the past seven years, it has been on the job almost daily, logging better than 20,000 work-packed hours. Yet, in all that time, it has never required a major overhaul—and still doesn't—thanks to Cities Service C-300 Motor Oil.

Says President Earl Collinson: "That's typical of the kind of results I'm getting using Cities Service fuels and lubricants in *all* my equipment—tractors, bulldozers, cranes, crushers, and compressors.

"Multi-Purpose Trojan H-2 Grease, for example, solved a bearing problem that we had on our vibrating screens. In cold weather they'd bind so badly that we had to heat them to get them going—but as soon as we switched to Trojan H-2, with its high temperature performance and low temperature pumpability, the trouble disappeared. Experiences such as this have convinced me that nothing compares to Cities Service lubricants for a rugged quarry operation such as ours."

This is one of a continuing series of reports from quarry operators for whom Cities Service products have proved ideal and unmatched. Your local Cities Service Lubrication Engineer can explain the many reasons why. Why not have a talk with him. Or write: Cities Service Oil Company, Sixty Wall Tower, New York 5, N. Y.



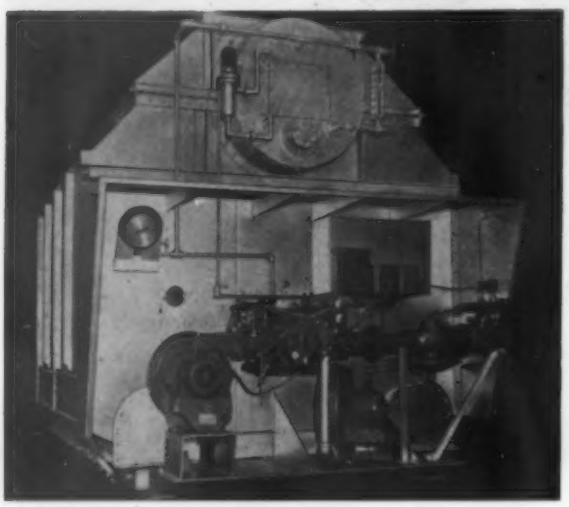
MORE OF COLLINSON'S EQUIPMENT. In addition to its 1½ yard Northwest shovel, the firm has two Bucyrus-Erie cranes, two tractor-dozer units, a Gardner-Denver air compressor, and two Austin Western crushers—one jaw crusher and one roll crusher. Six stationary diesels power the compressor and crushing units, and these diesels have averaged 12,000 hours before major overhaul with Cities Service C-300 Motor Oil.

CITIES SERVICE

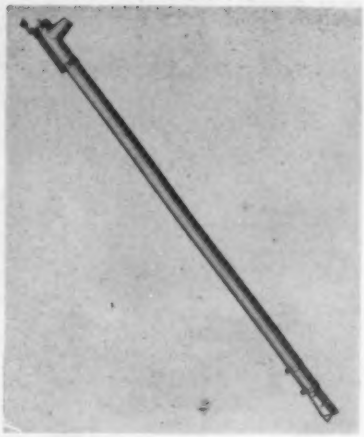
QUALITY PETROLEUM PRODUCTS

New Machinery and Equipment

(For More Information Use Card on Page 101)

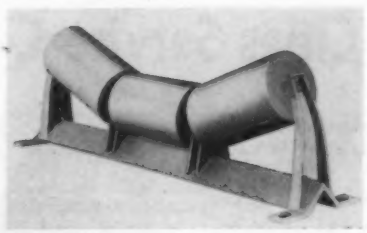


● Recently added to the Union line of process heating equipment was the type MH packaged vaporizer which was designed for use with Dowtherm "A" or "E" Para-Cymene or Anisole to provide controlled temperatures over a broad range. Featuring three-drum design, the MH meet requirements from 3,700,000 to 15,000,000 BTU per hour. ← (51)



● A versatile auger which handles both dry and liquid materials has been introduced by the Dultmeier Manufacturing Company. Called the Auger-Scoop, the tool is adjustable from 16 to 21-ft. and is 4-in. in diameter. It will operate with a one-half in. electric drill, electric motor, or gas engine. ↑ (52)

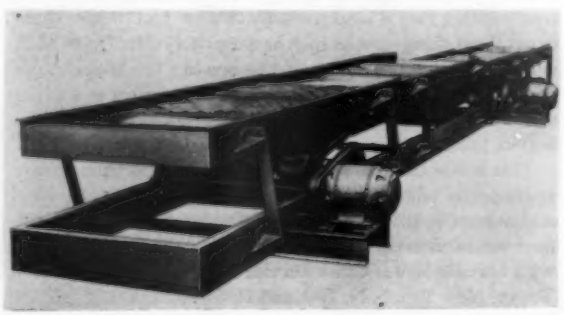
● Describing the new series of in-line helical gear drives manufactured by the Link-Belt Company is this new 16-page book, No. 2651. Load classes for over 250 applications, overhung load ratings and dimension tables are included. ↑ (54)

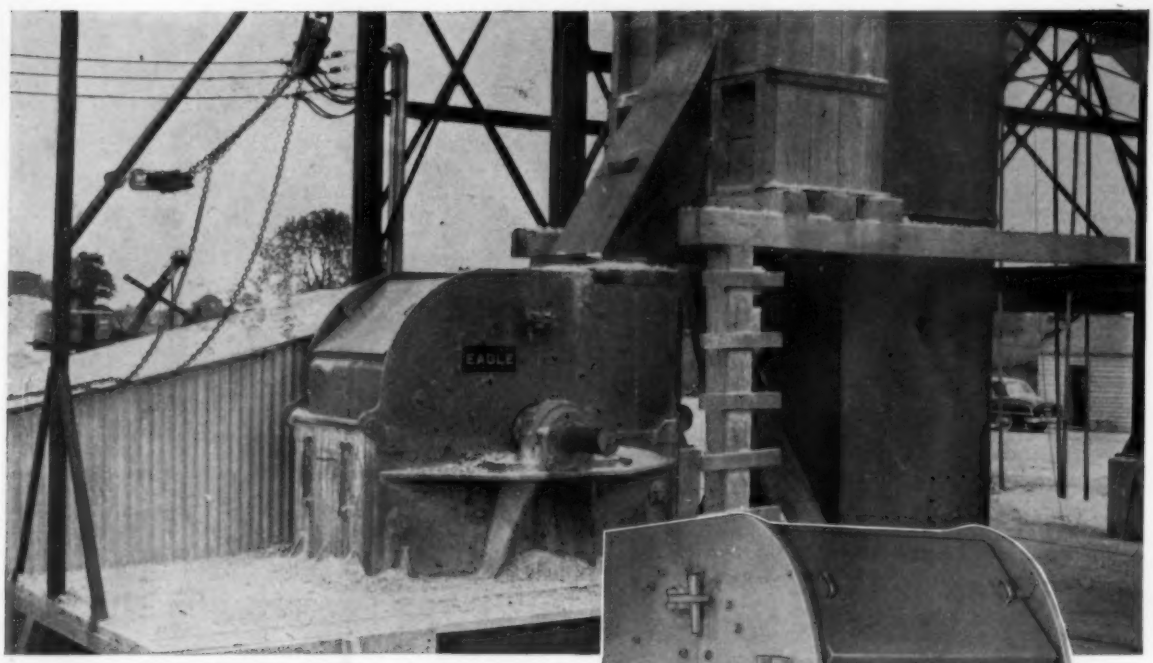


● The Series 50 belt conveyor idler has been added to the line of conveyor belt idlers made by the Link-Belt Company. The new idlers are available in both a greaseable type, with one-shot lubrication serving all three rolls at once, and a factory sealed type, requiring no further greasing. ↑ (53)

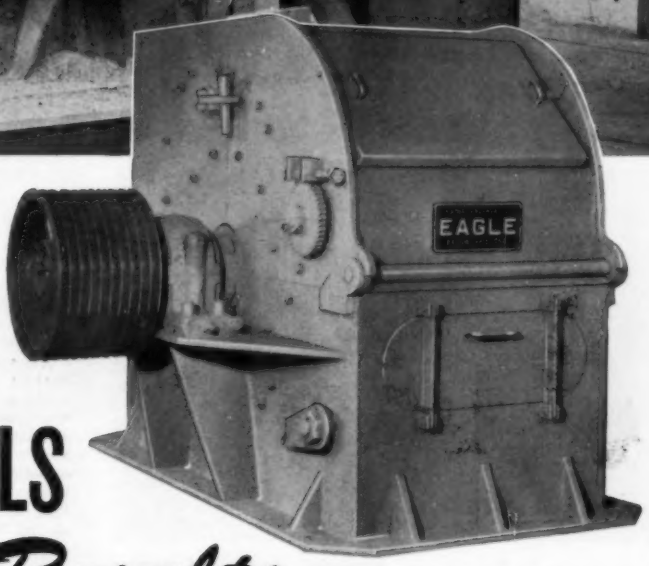
● A new line of front mounted single telescopic hoists for use with 8 to 15-ft. bodies has been introduced by the Galion Allsteel Body Company. These telescopic hoists are reputed to have greater lifting capacity while weighing less than underbody hoists. This has allowed an increase in payload capacities which now range from 3 to 14 cu. yd., and from 9 to 20 tons. ↓ (55)

● The Fuller Company has introduced this inclined-grate cooler which will handle kiln discharge at the rate of 1500 tons per day and will cool materials from 2,400 degrees F to 250 degrees F. → (56)





Amazing results have been obtained on this Eagle 36-42 installed in Wyandot-Dolomite Corporation's quarry, Carey, Ohio.



EAGLE HAMMERMILLS

Pay off in Results...

This newest hammermill-pulverizer is designed to do that larger, heavier job. Makes quick work of limestone or any stone up to 3", at the rate of 100 to 250 tons per hour.

The consistently high quality and cubical shape of EAGLE processed limestone is the talk of the "quarry-town". In many cases it eliminates the need for a primary crusher.

SKF spherical, roller type, self-aligning bearings are typical of the quality throughout. Adjustments easily made on grate bars and breaker plates while machine is in operation.

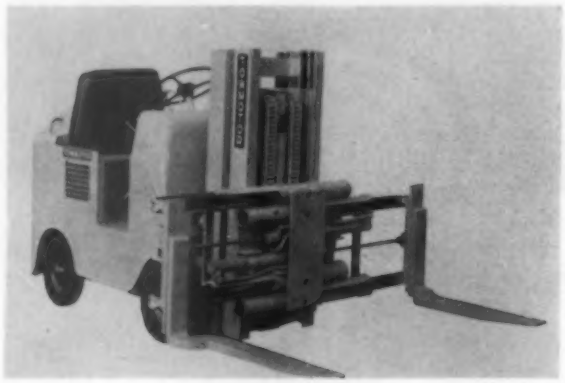
Send for complete specifications, Folder 1150.

EAGLE CRUSHER CO., Inc. GALION OHIO·U·S·A

JAW CRUSHERS · IMPACT BREAKERS
PULVERIZERS · CONVEYORS · LOADERS

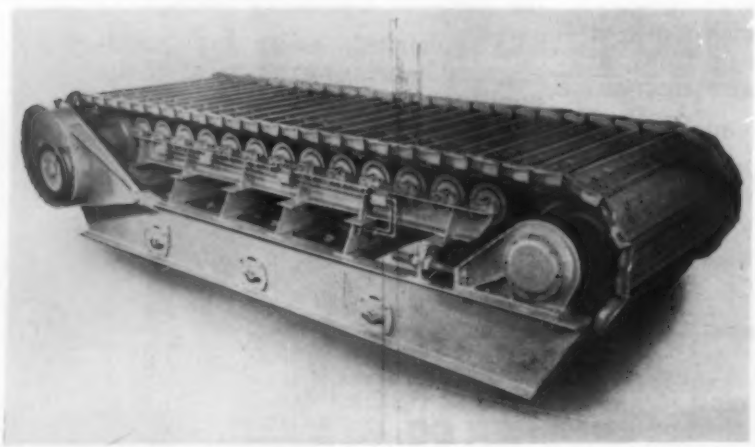
● An improved type material level indicator for process industries is now offered by the Fuller Company. The device functions at bin temperatures up to 300 degrees F. Suitable for all dry, pulverized, fine, crushed and granular materials, it can also be adapted for use with corrosive materials. ▲ (57)

● Two new motor graders have been added to the line of the Huber-Warco Company. The 7-D features 140-horsepower while the 6-D is of 100-horsepower design. Both feature a new torque converter and full power shift transmission. Also standard equipment on both models is a power sliding moldboard, operated hydraulically, allowing the driver to power-shift the moldboard out of the way as he approaches a culvert or post. ▲ (58)



● An answer to the receiving, production, storage and shipping of materials of diverse size is now provided by a recent development of the Towmotor corporation—a hydraulic clamp and offset fork attachment, adaptable to all Towmotor lift trucks. With this accessory, the lift truck carriage may quickly be adjusted laterally to handle heavy loads of various sizes and shapes. ▲ (59)

● Engineered by Mobile Drilling, Inc. for light, powerful, and low cost drilling, the Model B-40 Mobile drill is equipped with a 15 h.p. hydraulic motor which is geared to high torque low speeds, giving continuous drilling action, with capacities up to 75-ft. as an auger drill. ➔ (60)



● Heavy duty Manganese Feeder using standard rollers, chain, and final drive gearing made by National Iron Company, Duluth, Minn. A chain pitch of only 8" on this heavy duty feeder provides a more uniform feed of material to belts, screens, etc. Anti-friction bearings are installed on head and and tail shafts and in shaft mounted reducer. ➔ (61)

POWER HYDRAULIC CONTROLS and hydraulic-actuated clutches keep even the roughest jobs rolling smoothly. Hydraulic system eliminates need for more than 100 mechanical parts. Self-compensating clutches need no close or frequent adjustments.

TOUGH, IMPACT-RESISTANT STRUCTURE with all-welded, stress-relieved lower and upper frame helps rig absorb digging shock . . . handle the worst rock jobs with little need for maintenance and repair.

MORE POWER — Anti-friction bearings, splined shafts, precision machinery alignment help convert more of rated horsepower into usable power. Rugged construction permits use of extra power.

SPECIAL EXCALODER ATTACHMENT for underground loading or general bulk materials handling. The Excaloder features straight line bucket action and unusually low overhead clearance.

How to step up ROCK OUTPUT

Be ahead on every job with all these Link-Belt Speeder features

WHATEVER size rock rig you need, there's an advanced-design Link-Belt Speeder that can handle rugged work faster, easier, at less cost per ton or yard. Every Link-Belt Speeder rock shovel offers you Speed-o-Matic—the *true* power hydraulic control system. It's designed to make the operator's job so easy, so non-fatiguing that he'll utilize the machine to its full productive capacity—all shift long. And what a capacity! On-the-job figures show that Speed-o-Matic—even when the machine is wading through shot rock—accounts for output increases of up to 25% or more per shift!

Precision built throughout, a Link-Belt Speeder has an all-welded, stress-relieved upper and lower frame. Its power train features anti-friction bearings, splined shafts and cut spur gears. Quality construction like this pays off in lasting top performance, lower costs for maintenance and service.

For details, see your distributor or write LINK-BELT SPEEDER CORPORATION, CEDAR RAPIDS, IOWA.

Faster, stronger — from boom tip to treads

- Rugged, all-welded upper and lower frames, plus all-welded boom and dipper sticks for maximum strength-to-weight ratio
- All-manganese bucket*
- Powerful Independent Chain Crowd for positive crowd and retract, minimized maintenance
- Hydraulic dipper trip
- Torque converter units for greater shock absorption, multiplied torque when digging gets rough*
- Self-cleaning tracks and drive sprockets
- Powerful, two-directional automatic traction brakes which serve as digging locks
- Large diameter ring gear and conical rollers for faster, smoother swings
- Two-speed travel in either direction**
- Independent Swing and Travel that saves one hour a day in shifting time**
- Sealed track rollers keep grease in, dirt out**

*Optional, extra

**For most models

LINK-BELT SPEEDER

Builders of a complete line of crawler and rubber-tired shovel-cranes

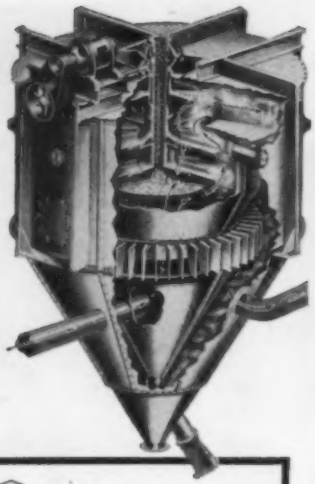
13,964

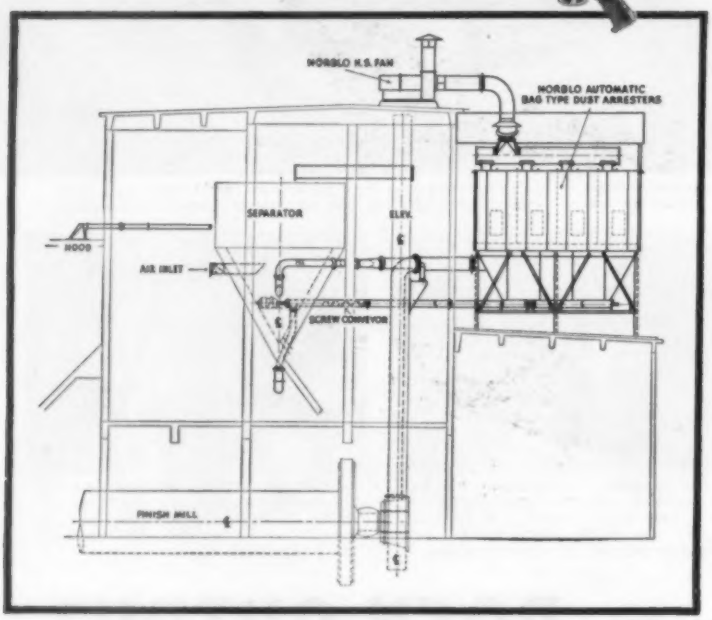
Norblo

Cement AIR Cooler

and Dust Collection System

Increases finish mill efficiency
Improves operating conditions





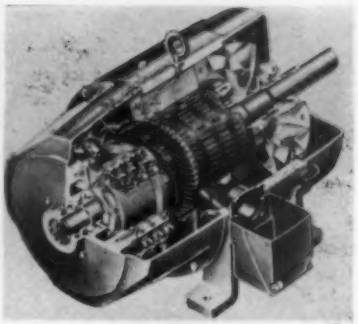
Cement temperature reduced to 200° or lower

The main facts of importance to you as a cement mill operator are found in the display headings above. They've been proved by actual performance in hundreds of American and foreign mills.

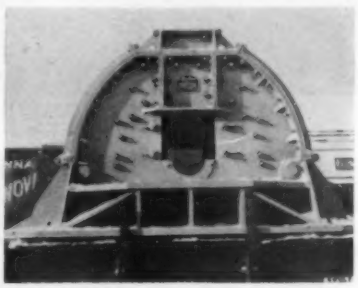
Norblo positive temperature control during the entire grinding process eliminates higher temperatures which damage the finished product. Cooling also increases the efficiency of the mill and separation system, and promotes safety of workmen, equipment and product.

How the Norblo Patented Cement Air Cooler as combined with Norblo Automatic Bag Type Dust Collector cleans up the entire milling process is fully described in our Bulletin 165-1. Write for it today.

The Northern Blower Company
Engineered Dust Collection Systems for All Industries
6407 Barberton Ave. OLympic 1-1300 Cleveland 2, Ohio



● Pictured above is one of the new line of General Electric generators. New design features include field coils insulated with mica, glass and other inorganic materials; coils encapsulated in heat resistant polyester compound; and brush rigging yokes of heat and moisture resistant polyester glass. ▲ (62)



● A new Hy-Ton secondary impact crusher has been placed in production by the Crusher Engineering Division of Poor and Company. Features of this model include synchronized adjustment of upper and lower breaker blocks; hydraulic adjustment, removal, and replacement of bearings; and improved distribution of weight in the hammers. ▲ (63)

● Koehring Company has issued this colorful eight-page pictorial booklet which describes the mechanical and application features of the Koehring self-propelled RailAid. Working either on or off its own rail car, the RailAid crane safely lifts 6.9 tons on the car, 8.9 tons on the ground. ▲ (64)

Preliminary 1955 Report of Mineral Output Reveals Gains for Eastern States

Value of mineral production in New York in 1955 totaled $215,248,000, a 12 percent increase over 1954, according to estimates of the U. S. Bureau of Mines. Twenty mineral commodities were produced in the state during the year. Cement, iron ore, stone, sand and gravel, salt, zinc, and petroleum, in order of decreasing value, supplied 91 percent of the total dollar value of the mineral production.

Nonmetallic minerals dominated 1955 mineral production in New York, representing 66 percent of the total value. Portland cement production remained an important factor in the state's mineral economy, with output in 1955 increasing 21 percent in value. Stone, including basalt, granite, limestone, marble, sandstone, and miscellaneous stone, ranked second to cement in value of output, with an estimated $29,860,000. Production of sand and gravel declined 3 percent in value in 1955, compared with 1954.

New York continued to be among the principal salt-producing states, but output declined slightly in 1955. The mineral industries of the state continued to produce clay, emery, garnet, gypsum, lime, marl, slate, talc, and wollastonite, all showing increases in 1955 except emery and slate.

Developments in the state's mineral industries during 1955 included the construction of a new primary and secondary limestone crushing station by the New York Trap Rock Corporation at its Haverstraw plant. The new facilities, costing about $1,000,000, increased company production by 20 percent. New York Trap Rock also purchased the land and basalt plant (annual capacity 500,000 tons) of the West Nyack Trap Rock Company. North American Cement Corporation acquired tracts of land containing shale deposits near the Howes Cave cement plant to supplement other deposits recently exhausted. . . United States Gypsum Company announced early in the year that a new plant would be built at Stony Point to produce gypsum board. Capacity was about 20 carloads of gypsum board a day, with a labor force of about 160.

The value of mineral production in Delaware, Maryland, New Jersey, Virginia, and West Virginia increased in 1955 over 1954, according to estimates of the U. S. Bureau of Mines. The rise was due largely to higher bituminous coal output, but substantial increases were apparent in a number of other commodities.

Major commodities produced in the area from a standpoint of total value were coal, sand and gravel, and stone. West Virginia and Virginia remained the largest mineral-producing states, in point of value, with New Jersey, Maryland, and Delaware following in that order.

Delaware—The mines and quarries of Delaware continued to produce clay, sand and gravel, and stone in 1955 at approximately the same rate as in the previous year.

Maryland—The value of mineral production in Maryland in 1955 increased 9 percent over the previous year—from $30,775,000 to $33,400,000. Output of sand and gravel rose from 10,097,800 tons in 1954 to 11,200,000 tons in 1955. Stone production increased from 4,993,895 tons in 1954 to 5,200,000 tons in 1955. During the year the Titanium Ores Corporation continued its development work at Cove Point, 65 miles south

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eliminate "blinding" and "clogging" of wire screens, thus making beating and brushing practices obsolete. Designed for heavy-duty service, HANCO Heaters with Quick Change Attachments are quickly installed and easily adapted to new or existing screen installations with such features as large capacity secondary terminal, a 16 step temperature changer, dust enclosure compact, exclusive overload protector.

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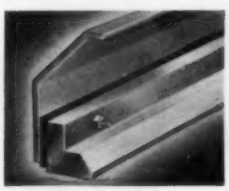
(Replaces Existing Parts)

Fiberglass plate — insulates conductor from frame — eliminates draw bolt insulators.

Wedge-shaped conductor bars offer positive contact with cloth.



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New Heavyweights—New Tandems! All-new heavyweights in 9 wheelbases, with maximum G.V.W. ratings up to a new high of 32,000 lbs.; G.C.W. up to 50,000 lbs.

Ultra-Modern Features! Tubeless tires, standard; High-Level ventilation and panoramic visibility; plus Concealed Safety Steps on most models.

Wider Range of Drives! There's an automatic drive in every series with new Powermatic for most middleweights and heavies; Hydra-Matic for light-duty models. Both extra-cost options. A new 5-speed transmission is standard in 9000 and 10000 series models; optional at extra cost in other heavies and most medium-duty models. New heavy-duty 5-speed is an extra-cost option in models with new Loadmaster V8.

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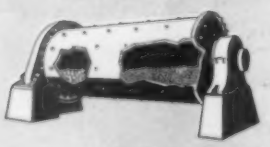
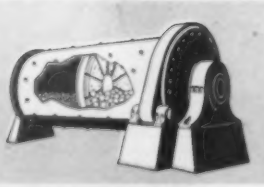


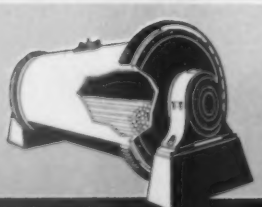
BALL AND TUBE MILLS

Standard Heavy Duty Ball or Tube Mill has replaceable cast alloy iron or steel lining . . . or may be lined with POROX (porcelain) for light duty applications.



COMPARTMENT TUBE MILLS

Separate compartments are charged with different size grinding balls. Compartments operate as several mills in series.



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Particularly desirable when a relatively coarse product with a minimum amount of fines is desired.

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MONTREAL

of Annapolis. Calcium carbonate from sea shells for agricultural lime and poultry feed was also recovered by this company.

New Jersey—New Jersey mineral production rose in 1955 to $49,865,000, 9 percent above 1954. The increased output was due, in large measure, to a 56 percent jump in iron ore production from 476,192 long tons in 1954 to 744,000 long tons. . . Sand and gravel and stone output dropped 5 percent and 3 percent, respectively, in 1955, compared with the previous year.

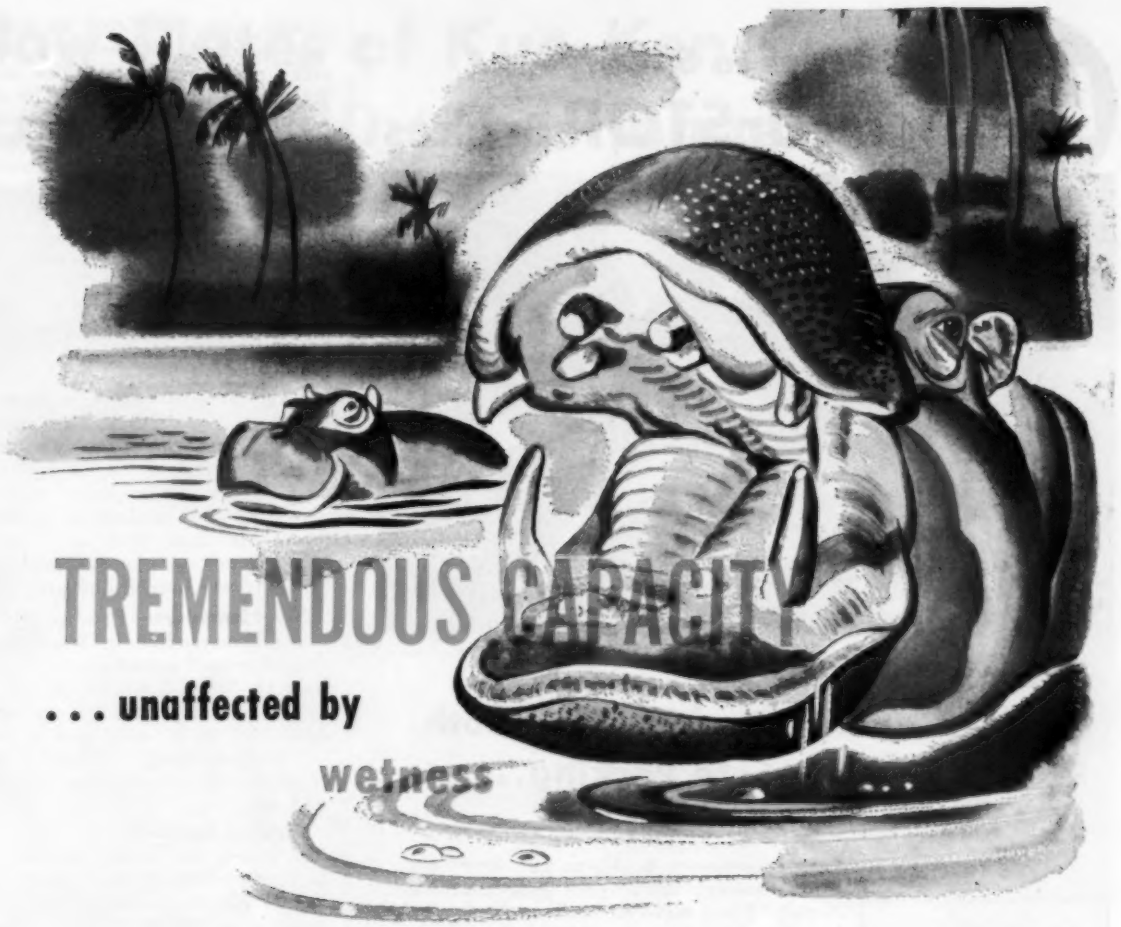
Virginia—The value of Virginia mineral production increased from $153,731,000 in 1954 to $174,000,000 in 1955. This 13 percent rise resulted primarily from greater coal production with its accompanying higher total value. The stone quarries in the state produced at approximately the same rate as in the previous year. Sand and gravel output declined from 7,115,403 short tons to 6,400,000 tons.

West Virginia—The value of mineral production in West Virginia in 1955 increased 21 percent, compared with 1954. This increase paralleled the estimated 23 percent rise in the value of bituminous coal production. Natural gas output increased from 191,601,000 cu. ft. to 197,800,000 cu. ft. Stone production rose from 7,314,934 tons to 7,800,000 tons.

The value of New England mineral production in 1955 increased 6 percent over 1954, according to estimates made by the U. S. Bureau of Mines. New England continued to produce dimension stone and sand and gravel, mica, beryl, columbium-tantalum ore, gold, silver, and copper, and various other commodities. Vermont remained the largest mineral-producing state from a standpoint of total value, with Massachusetts a close second. Maine, Connecticut, New Hampshire, and Rhode Island followed in that order.

Connecticut—Major mineral commodities produced in Connecticut in 1955 were sand and gravel and stone. In addition, the state's mines yielded clay, feldspar, mica, lime, peat, and columbium-tantalum ore. The value of mineral output remained virtually unchanged at approximately $9,600,000 in 1955.

Maine—Mineral production in Maine increased from $10,556,000 in 1954 to $11,600,000 in 1955. This rise was largely the result of expanded cement production. The Dragon Cement Company, in addition to increasing the capacity of its



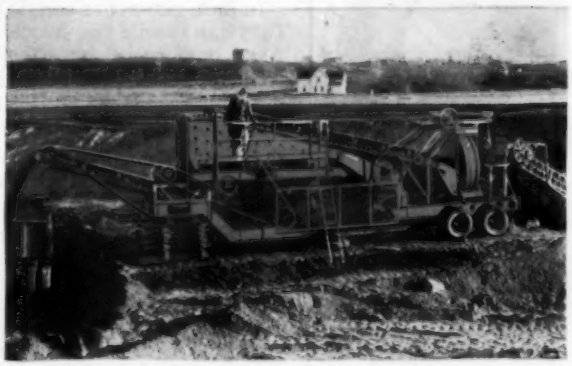
Big and adaptable, the hippo is a master in water. He can float like a log . . . submerge for 30 minutes . . . run across the bottom of a lake at eight miles an hour. On land, he runs as fast as a man . . . gallops at considerable speed . . . forages more than 25 miles a day to satisfy his huge appetite.

Universal built the 880 SENIOR "R" GRAVELMASTER like Nature built the hippo — for sustained performance under any conditions.

Wet, sticky material won't stop production when you're operating an 880 Senior "R". A 10" x 36" jaw teamed with a 30" x 26" roll crusher and a 4' x 12' inclined gyrating screen assures tremendous capacity. It takes an *inclined* gyrating screen to handle water-soaked pit-run material smoothly and efficiently.

Big and adaptable, the 880 Senior "R' can range like a hippo over wide territory. Travel it cross-country and see! The hippo-like quality of tremendous capacity unaffected by wetness adds to your profit when you own an 880 Senior "R".

Compare the 880 Senior "R" with competitive plants and you'll find a lot of other hippo-like features. Everything bigger — but the price!



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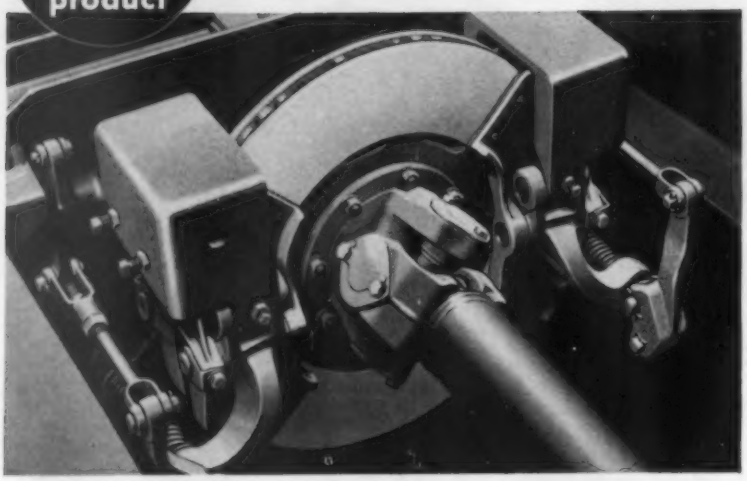

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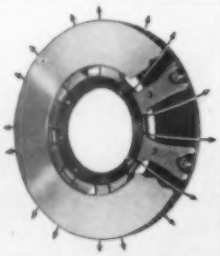

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• The terrific heat generated in braking cuts lining life. TRU-STOPS quickly dissipate this heat. Most of the disc is exposed to the air even during braking. And a cooling jet of air circulates through the disc, prolongs lining life.

Real Emergency Braking. TRU-STOPS *are real emergency brakes—not just "parking brakes."* They serve as auxiliary brakes on long down-grades and can bring the vehicle to a smooth, quick stop if service brakes suddenly fail.

In fact, TRU-STOPS can do this and more. They can handle the vehicle with safety so it can be removed from the road.

Smooth, Positive Stops. Pressure is in direct proportion to the pull on the brake lever. There is no dangerous self-energizing or "over-braking."

Safe Parking. TRU-STOPS hold on grades—prevent "parking brake" accidents.

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cement plant, completed an access tunnel under U. S. Route 1 to connect a new limestone operation with the old and current quarry. The old workings will be abandoned as soon as the new quarry site is stripped and quarrying operations can begin.

The value of sand and gravel output declined 27 percent in 1955, as compared with the previous year. The value of stone output remained approximately the same as in 1954, although several dimension stone quarries operated at full capacity to supply stone for the new state capitol building in Augusta.

Massachusetts—Value of mineral output in Massachusetts increased 9 percent in 1955, compared with 1954—from $18,839,000 to $20,600,000. Output of sand and gravel rose 22 percent; stone remained at approximately the same level as in 1954. Other important minerals produced in 1955 were burned lime and clay.

New Hampshire—Production of mineral commodities in New Hampshire decreased approximately 7 percent in 1955—from $2,357,000 to $2,200,000. Major mineral produced continued to be sand and gravel. Other commodities, in order of decreasing value, were granite, feldspar, and mica.

Rhode Island—Graphite, sand and gravel, and stone continued to be produced by the mines and quarries of Rhode Island in 1955. The most important mineral was sand and gravel, followed by the production of crushed granite and miscellaneous stone.

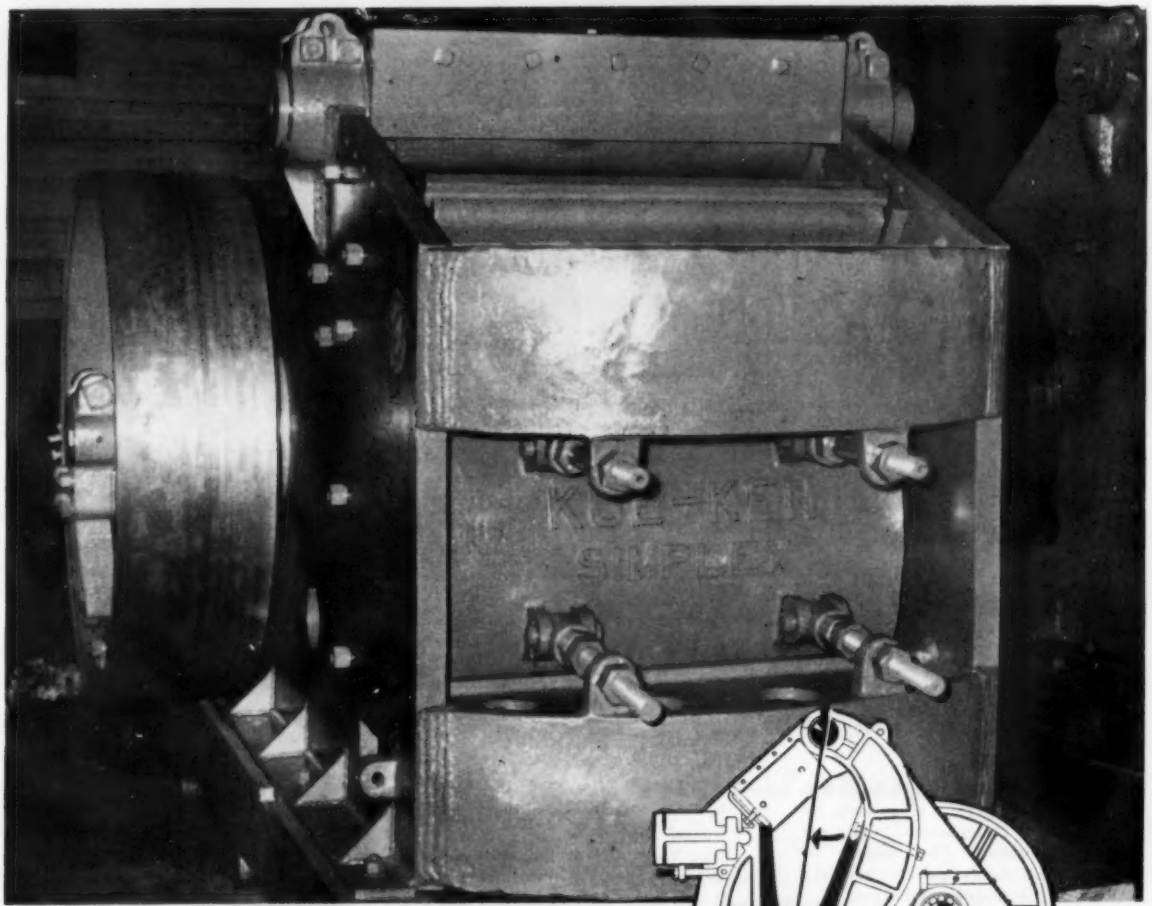
Vermont—The mines and quarries of Vermont continued to yield in 1955, in order of decreasing value, stone, slate, copper, and asbestos, as well as other minerals. . . The value of state production rose from $20,466,000 in 1954 to $21,500,000.

Universal Atlas Expansion To Raise Output One-Third

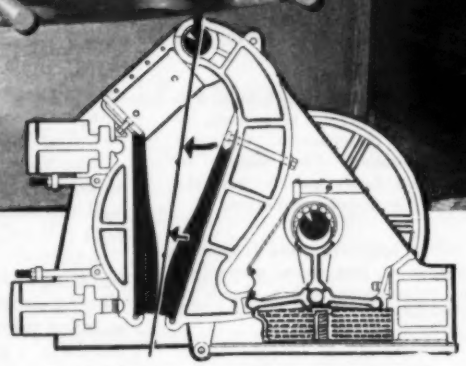
Universal Atlas Cement Company has begun to implement plans for new construction at its Hudson, N. Y., plant which will increase the production and shipping capacity there by approximately one-third. A contract was awarded to the Rust Engineering Company, Pittsburgh, Pa.

Charles B. Baker, president of this U. S. Steel subsidiary, stated that work will begin immediately on the installation of a fourth rotary kiln with supporting facilities. Completion of the new construction is estimated at mid-year of 1957.

Jaw Plates of Kue-Ken Crushers Last 5 to 10 times longer!



Kue-Ken is the most economical crusher to operate. The exclusive principle of "crushing without rubbing" substantially reduces the main cause of jaw plate wear. Power consumption is less. Automatic overload release in flywheel eliminates breakage of any parts. Lubrication is automatic . . . Kue-Ken is the only crusher with crankcase-type lubrication system. All mechanism operates in a sealed oil bath. Greater capacity than any other crusher of equal jaw width. Model 80 (as illustrated) 36″ x 10″ crushes at 368 strokes per minute with output of up to 50 tons per hour of uniform, cubical product—even from hardest ores.



See how the hinge pin is located on the center line of the crushing zone. The jaw moves in an almost straight line. Rock is instantly gripped and crushed without rubbing.

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"LOWEST COST-PER-TON CRUSHING"

Jaw Crushers **Gyratory Crushers** **Overhead Eccentric Crushers** **Revolving Screens**
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Sand and gravel plants all over the country are discarding their sledge hammers and installing low cost Cleveland Vibrators on bins, chutes, and hoppers. Any granular from the coarsest crushed stone to the finest sand and powders responds to the firm action of vibration.

Cleveland Vibrators are low in original cost, inexpensive to operate, require little maintenance, and are quickly installed. The savings in wasted man hours quickly pays the cost of a Cleveland installation.

We will be happy to quote prices and specifications. Just write, giving detailed information and a sketch of your installation.

Air or Electric
Portable or Permanent
Silent or Standard

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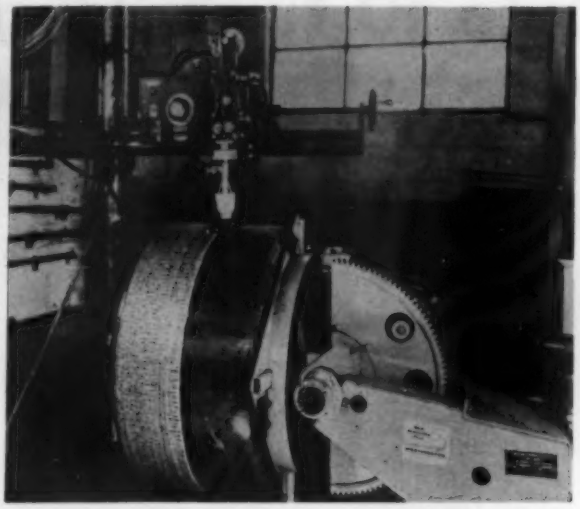
Hardsurfacing Crusher Rolls By Automatic Submerged Arc Welding



Left: An automatic submerged arc set up for hardsurfacing crusher rolls. The roll is clamped to the welding positioner, which automatically turns the roll 24 in. a minute. The automatic welding head is adjusted and manipulated by a low-cost welding fixture.

IN manufacturing crusher rolls an automatic submerged arc welding method of hardsurfacing is used that could very well be used by producers and manufacturers of cement, crushed stone, lime, gypsum, sand, gravel, and other nonmetallic minerals as a money saving maintenance procedure. The particular rolls illustrated are used in cinder crushers, but the time- and money-saving automatic submerged arc hardsurfacing method could be applied to many types of crusher rolls and other equipment with the proper hardsurfacing material.

The rolls are 40 in. in diameter by 20 in. wide and have an original wall thickness of 1½ in. Completed, each roll weighs 2,100 lb.

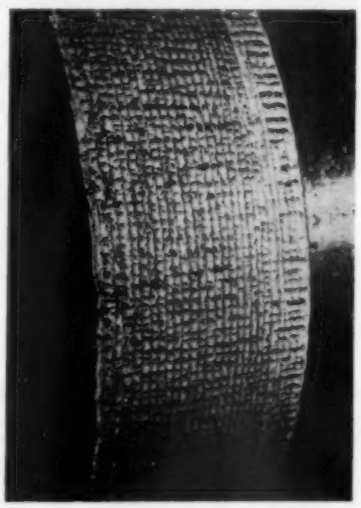
Automatic submerged arc hardsurfacing procedure is as follows: The fabricated roll is clamped to a welding positioner which turns the roll 24 in. a minute. A Hobart Model 16DA automatic welding head with constant voltage power supply feeds Coast Metals 92A, 3/16-in. wire at the rate of 40 in. per minute at 520 amperes, 29 volts. Coast Metals 92A is an alloy steel electrode fabricated by encasing particles of alloy metals in a continuous steel tube.

A total of 200 in. of wire is deposited in one revolution. Two layers of 54 passes each are required to give the desired thickness of 5/16-in. hardened surface. The total amount of wire used for two layers on each roll is 1,696 ft. or 165 lb.

Time required to deposit two layers or 165 lb. of wire on one roll was 10 hours and 40 minutes. The result is a much better surface, applied in less time than with manual welding.

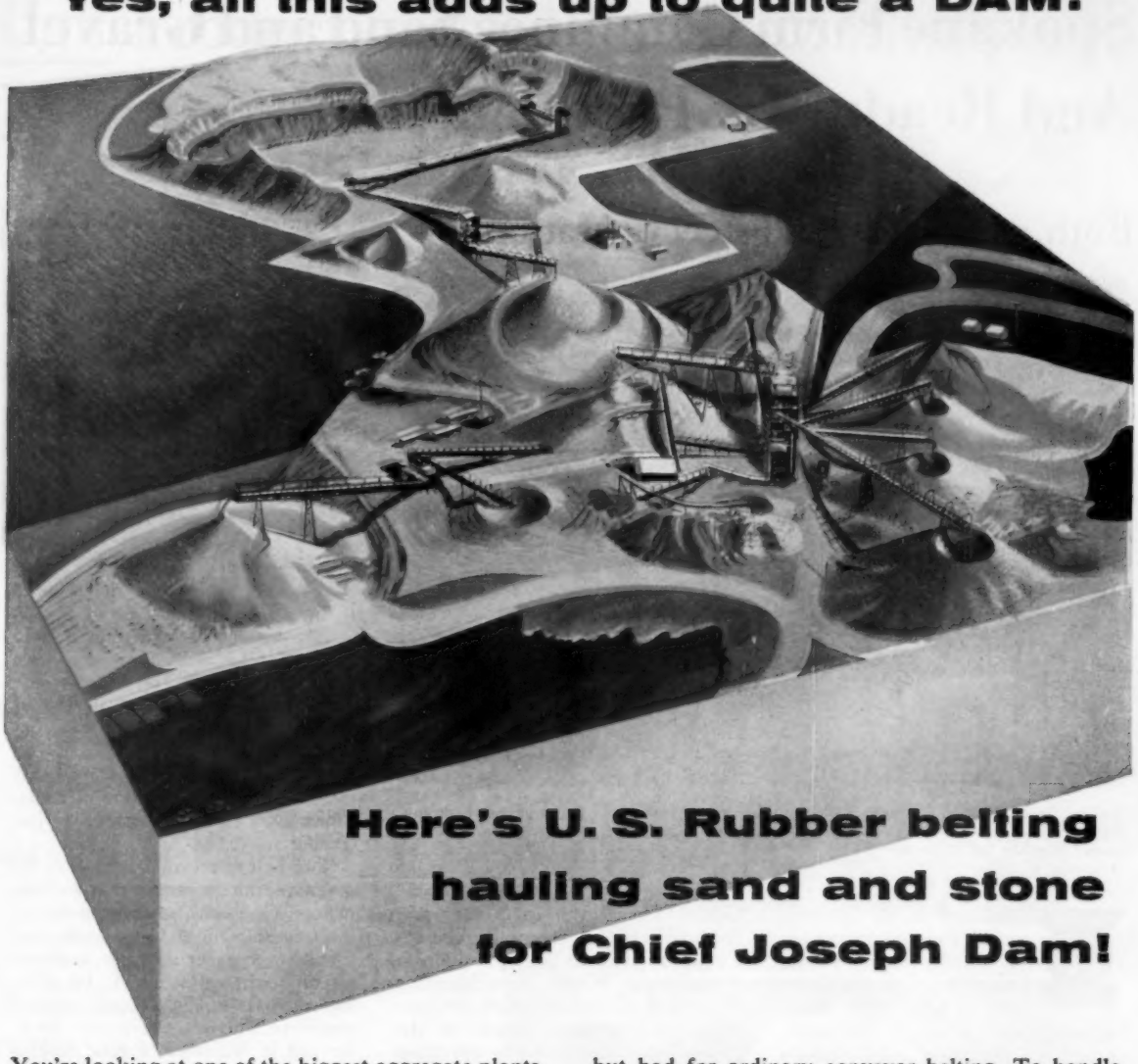
According to an announcement released by New York Trap Rock Corporation officials, this firm is planning to consolidate all of its principal offices in Rockland County, N. Y. Executive, operating, sales, and and accounting staffs will be housed in an office building in West Nyack.

A $75,000 rock crushing plant is under construction at the Union Sand and Gravel Company's operation at Yardley, Wash., a $100,000 installation erected last year.



Above: A closeup of the crusher roll shows that the smooth continuous bead makes a tough surface for resisting wear.

Yes, all this adds up to quite a DAM!



Here's U. S. Rubber belting hauling sand and stone for Chief Joseph Dam!

You're looking at one of the biggest aggregate plants ever set up. It supplies aggregate for concrete for the big Chief Joseph Dam in the State of Washington—the dam that will have the world's largest single-unit powerhouse under one roof, the dam that will rank second only to Grand Coulee in operating capacity. Nearly 2 million cubic yards of concrete will be needed to build Chief Joseph.

This aggregate (sand and stone) ranges from fine sand to extraordinarily heavy boulders as large as 20″ in diameter. The rock breaks clean, leaving sharp edges which are good for concrete interlock but bad for ordinary conveyor belting. To handle this most critical portion of the haulage, United States Rubber Company conveyor belts were selected. Although now in their fifth construction season, the belts are still going strong. This is another example of U. S. Rubber's Three-Way Engineering Service: "U. S." Belt engineers work with the designers of the conveyor system and the engineers of the dam—to provide the *right* belt for the jobs.

"U. S." Belting and Engineering Services are obtainable through the 27 "U. S." District Sales Offices or write us at Rockefeller Center, New York 20, N. Y.

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Mechanical Goods Division

United States Rubber

Spokane Firm Combines Sand and Gravel And Ready-Mix Production

Both are modern all-steel operations

The Ace Sand & Gravel Company washing and sizing structure, with the scrubber at the top. The question-mark-shaped square piping near the center conducts waste water to an underground pipeline for disposal.

Another ON THE SPOT Report

THE last decade has been one of constant expansion for the Spokane, Wash., firm of Ace Concrete Company. Operating a small batching plant adjacent to a sand-and-gravel operation at Dishman, eastern suburb of Spokane, shortly after the close of World War II, the concern later acquired this aggregate plant and pit as well. A few years ago the company replaced the old batch-plant with a modern, all-steel pre-mixed concrete setup.

By HARRY F. UTLEY

With only limited acreage and indications of depletion of the deposit, the company next acquired extensive new deposits across the road from the existing plant, and about a year ago Ace began erecting an up-to-date $150,000 aggregates plant and opened up the new pit to supply raw material. At the same time the ready-mix plant was also moved across the highway.

Operating as the Ace Sand & Gravel Company, Inc., the new crushing-washing-screening plant has a capacity of about 200 t.p.h. Pioneer Engineering Works contributed a great deal in the design of the new plant and supplied much of the processing equipment. The operation is particularly ship-shape in appearance, all wiring being underground. Waste water, too, is carried away by underground piping to the old pit across the road.

Excavating is being done by a Sauerman 1,000-ft. slackline cableway, a Rowe double-drum hoist pulling the 4-cu. yd. bucket. Loaded, the bucket travels 500 ft. per minute and returns empty at an 800 ft. per minute clip. The bucket discharges into a 50-ton hopper from which a pan-feeder lays it on a 48-in. by 60-ft. belt conveyor leading up to a scalping screen.

The scalping deck of the Pioneer 4- by 10-ft. Mesabi-type screen is fitted with 3-in. square openings in punched plate with four wear bars welded lengthwise on the screen plate. These bars permit the larger boulders to slide along without contacting the screen surface itself. All of the plus 3-in. gravel coming off the end goes directly into a Cedarapids 15- by 30-in. primary jaw crusher.

Two belt conveyors carry away the scalper and primary crusher discharge. One runs up to a screening-and-crushing tower, where a Symons 3-ft. cone crusher operates in closed circuit with a Pioneer 4- by 10-ft. intermediate screen to make crushed products. The other conveyor, 18 in. by 188 ft., carries the sand passing

This view shows the secondary and primary crushing stations and (left above) the crushed gravel screen.

High Production and Lower Maintenance–

You Get BOTH with "Eucs"

Built for tough off-the-highway service, Rear-Dump Euclids have increased production and reduced hauling costs on scores of open pit mining and quarry operations. Ability to deliver "plus" performance year in and year out has made "Eucs" the accepted standard for comparison . . . here are some of the reasons why:

RUGGED SIMPLICITY

Designed and built for long life and low maintenance cost. All of Euclid's experience and facilities are devoted to specialized off-the-highway earth moving equipment.

CAPACITY

Euclids have payload capacities of 10, 15, 22, 34 and 50 tons. Because they are matched to various sizes of loading and crushing equipment, "Eucs" provide a well balanced operation for open pit haulage and increase the efficiency of the loading unit.

POWER AND SPEED

Powered by diesel engines of 125 to 600 h.p. "Eucs" have top speeds with full payload, up to 36 m.p.h. Five and ten speed transmission, or torque converter with semi-automatic transmission available. The favorable ratio of horsepower to payload means more pay tons hauled every trip.

VERSATILITY

"Eucs" are efficient for moving any material on any length of haul; handle overburden, rock, coal, ore and other materials loaded by shovels, draglines, transfer hoppers and mobile loading equipment.

If you are interested in higher production at lower cost, have your nearby Euclid Distributor show you what "Eucs" are doing on work similar to yours. He'll be glad to make a hauling cost estimate for your job—no obligation, of course.

EUCLID DIVISION
GENERAL MOTORS CORPORATION
Cleveland 17, Ohio

Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE

Ralph Wilson, maintenance welder, applies a hard-surfacing rod to the edges of the 3-in. square openings and longitudinal wear bars of the Mesabi-type scalping screen.

the scalping screen and minus 1½-in. gravel up to a Pioneer Continuflo washing plant for cleaning and classification.

The washing plant is comprised of a revolving-drum scrubber, a 4- by 12-ft. triple-deck spray-equipped sizing screen, and a twin-screw sand dehydrator, operating to produce two blends of coarse concrete aggregates (1- to 1½-in. and 3/16- to 1-in.) and a minus 3/16-in. concrete sand.

These finished products discharge into three 45-ton capacity steel storage bins at ground level, the bins serving either as truck-loading units or feeding by side spouts to three belt-conveyors (18-in. by about 150-ft.) which stack the aggregates into piles for recovery by tunnel belts to the concrete plant. The sand stockpiling belt is mounted radially on a track, moved by cable and motor-truck, to build a kidney-shaped pile which allows ample drainage and drying before recovery.

A minus ¾-in. 100 percent crushed product is also produced by the cone crusher previously mentioned, but this is stored separately from the tunnel-recovery system and is loaded out by stockpile loader or crane into trucks.

The recovery tunnel, 350 ft. in total length, angles sharply between the sand and the gravel piles, with 100- and 250-ft. conveyor sections operating in the tunnel. The plant-produced sand is deficient in certain fine fractions; but rather than install grinding equipment, the company finds it more expedient to bring in a 30- to 200-mesh clean sand from an auxiliary deposit at Mead, Wash., about 11 miles north of the plant. Ten-ton dump trucks are used to haul in the fine sand, which is blended into the supply by hopper and feeder at the transfer point between the recovery belt and the 24-in. by 225-ft. inclined belt conveyor running up to the concrete-plant bins.

The C. S. Johnson concrete plant has 4-compartment bin storage for 250 tons of aggregates. Final preparation of the concrete is done in a Koehring 2-cu. yd. mixer to meet the requirements of the Spokane building code. The delivery fleet has grown to a total of 16 Challenge units mounted on Ford and G.M.C. chassis, drum capacities ranging from 3½ to 7 cu. yd. as agitators.

All equipment subject to abrasive wear — screens, crusher, excavator bucket, chute liners and the like — are regularly hard-faced by the plant's full-time maintenance welder, Ralph Wilson. Longitudinal wear bars and the square openings on the scalping screen are built up with Stoody 3/16-in. self-hardening rod. Corners and teeth on the bucket are re-built to size by welding with manganese and stainless steel, followed with a full overlay of Coated Tube Stoodite. Crusher jaws are renewed by welding sections of manganese round-bar stock to the worn portions to re-establish the ridges, or corrugations, and then finished with Coated Tube Stoodite along the ridges for resistance to wear.

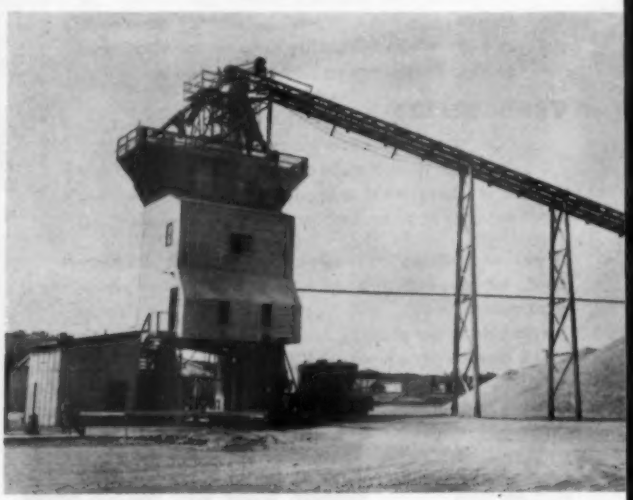
Loyd J. Borjessan is president and general manager of the Ace Sand & Gravel Co. and Ace Concrete Co. Mrs. Borjessan is secretary-treasurer of the corporation and serves actively as office manager, R. J. Jarvis is chief engineer and sales manager.

The Metropolitan Sand and Gravel Corporation, Port Washington and New York City, N. Y., has announced the election of the following officers: Herbert D. Merrick, executive vice-president; John J. Gates, vice-president; and Robert C. Greene, vice-president.

The Rescolite Company, Fort Smith, Ark., has completed an expansion of its facilities to increase production of pre-sized expanded-shale aggregate for use in the manufacture of structural concrete and concrete products. The present expansion increased production by 75 percent with the installation of a rotary kiln plant. Engineers made provision for future expansion.

A radial stacker conveyor distributes the sand over the end of the dog-leg recovery tunnel, for drainage and drying.

The concrete-mixing plant, with bulk-cement truck and trailer unloading alongside. The overhead aggregate bins can store 250 tons.



Bit for bit, regular or jet, you will find that *consistently*—day-after-day—you get faster penetration and more hole per bit with Hughes bits. The superior performance of Hughes bits has been proved in hundreds of thousands of wells — not just a hand-picked few — and in the drilling of more than a billion feet of hole throughout the world. HUGHES bits enable you to get your well down in the shortest possible time ... and to take *full* advantage of new drilling techniques.

Why That Good Man Left...

By ERNEST W. FAIR

AVERAGE employee turnover in a business is nothing more than a routine headache, but when a key man leaves the staff, a major problem always arises. Finding a replacement is seldom easy, and the dollars-and-cents loss in training some one to take his place can be costly.

The smoothness of a business operation depends on retaining such key personnel. Each time the firm loses a valuable man, the owner must not only go through the costly process of finding and training a replacement, but must also assume added duties in the interim.

One method of preventing such a situation is to recognize the reasons why such men leave and do something to prevent their leaving. This is the surest method of making certain that these good men remain with the firm.

In order to find the answers to this question of why valuable employees leave, interviews have been held, over a period of several months, with men who changed jobs. The results, in order of most frequent occurrence, and their explanations are given for the guidance of the reader.

Better Pay—More key men leave their positions for this reason than for any other. They cannot be blamed for such a step, taken to improve their economic position. In some instances this represents a move from one field to some other; in most instances it is merely from one firm to another within the same industry. The obvious solution is to make certain that key men are paid close to or on a level with the salaries offered by competing firms. Another solution is to set up a profit-sharing plan of some type. A third method is to keep selling them on the future earning prospects they will have by remaining with the firm.

Perhaps the safest procedure is to keep ahead of the prevailing salary scale of one's area with such individuals, if it is at all possible to do so. Considering how much it costs to train such an individual's successor, this little extra pay boost may not cost as much as appears at first glance.

Unpleasant Working Conditions—This factor covers many small details. In many instances the reasons given appear foolish to the employer, but they are serious to the employee.

Situations may exist in the organization which are most distasteful to employees yet are never apparent to the executive. When a job opportunity offering even equal salary appears, they may leap to take advantage of the proposition.

This is where the old suggestion box comes in handy. No matter how cordial relations may be with the staff, rare is the individual who will voice unpleasant facts to his employer face to face. In many instances, however, he will express them anonymously through a suggestion box.

Another method is to make consistent inquiries among employees with a view to finding out how they and their fellow workers feel about their work. Sometimes the people with whom we do business can help us. Often friends and acquaintances will know of such situations before we find out about them.

Our best method of combating such situations is to be aware of the possibility of their existence and be ever watchful for them. Often the executive who feels most secure that nothing of this nature exists on his staff is the very one who is unaware that irritations are troubling key men in his plant, and that they may result in the loss of a valuable employee.

No Future—Third in the list is this factor, of which younger men are particularly aware. Older employees often give little thought to their future with the business, other than reasonable security. Younger men feel otherwise. When there are key individuals on the staff in the below-40 group, it is wise to show them continually how good a future they have with the firm. Make certain that your firm offers such employees just as good a future as they can find with any competitor anywhere in the area; not just locally. Always be sure that such employees are kept aware of these possibilities.

"He's the best man we've ever had, and in a few years I plan to offer him a partnership," a business man friend once remarked in discussing his assistant. But he never bothered to hint of this opportunity to the individual himself, and one morning the man resigned to join a rival firm. Then it was too late.

Lack of Prestige—If the firm lacks prestige, there may be many job changes. Even the lowest-paid employee must have a sense of pride in the firm for which he works. This is of even more importance with the ambitious employee whom management particularly wishes to retain.

Building prestige is, of course, vitally important from a business standpoint. It is equally important that the individual employee need never apologize for his firm.

In firms enjoying high prestige, key men will often remain on the staff at even less pay than they could obtain elsewhere. That prestige is the kind which not only comes from outside, but which is tendered the employee within the organization.

If a valued assistant must perform menial chores as part of his job, is given no recognition from the top insofar as other employees are concerned, and never receives recognition for extra effort he puts forth on the job, he has the best reasons in the world for leaving the firm to go to a competitor.

Insecurity—The future security of the worker is in all the newspaper headlines. At no other time have key men been so conscious of the topic. From all appearances, this issue will continue to grow in importance.

The firm with a high record for employee dismissals is one where not even a key man can feel secure in his job. The older the individual employee, the more important security becomes.

The best assurance of avoiding loss of key men because of this factor is to make certain that every man knows that his job is secure as long as he fills it properly. When he hears rumors of how former employees have been dismissed for trivial reasons, insecurity enters the picture; and no matter how well he may have been treated as an individual, doubt will constantly arise in his own mind.

Whenever an employee is dismissed, it is important for every other member of the staff to know just why; it should never be left to the individual to give others a false picture.

These five reasons that key men leave their positions are those mentioned most often. The executive who carefully guards against these will have provided insurance against at least 95 percent of the possibility of losing his best employees.

Why this feeder doesn't cave in

● The reason is simply this: *The* PIONEER-ORO *Feeder is the most rugged feeder ever built.*

Take a look at its massive pans . . . cast from a special wear-resistant manganese steel, heavily ribbed, reinforced, and all the way from 9/16" to 1" thick, depending on width of feeder. The pans are supported by heavy, closely-spaced manganese steel rollers, keyed 3 to a heavy diameter shaft. Each shaft turns in 3 heavy-duty bearings rigidly supported on the feeder frame.

Takes heaviest dump loads

The PIONEER-ORO is designed for the roughest, toughest feeding jobs on earth. It withstands the impact of the heaviest dump loads. It shrugs off abrasion from hard ores, slag, flintrock, granite, and other coarse, heavy materials.

But the mighty PIONEER-ORO offers more than sheer, brute strength. It is a smooth-running, finely engineered unit designed to deliver a constant flow of heavy, abrasive material, with a minimum of maintenance. Even preventive maintenance costs are low.

Rivetless pans overlap and interlock

Pans, for example, overlap and interlock to provide added stability and stop leakage and spilling. Upturned end flanges also reduce loss of material. Drive links are cast as an integral part of the pan, so there are *no bolts or rivets that can loosen*. Easily replaced link bushings need no lubrication.

Sprocket teeth are readily reversed or replaced without taking the sprocket hub from the shaft or even disconnecting the pans. Like all other wearing parts, these teeth are cast from special wear-resistant manganese alloyed steel.

Supporting rollers and shafts can be removed, too, without disturbing the pans.

OTHER FEATURES

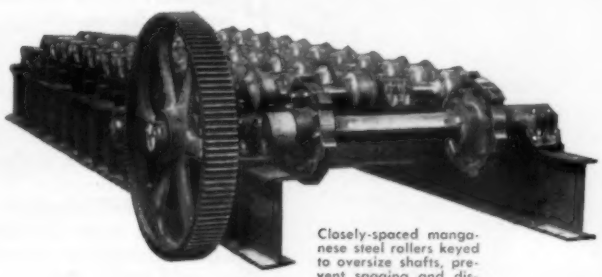
1. Patented lugs in pan links remove dirt, make links self-cleaning.
2. Feeder can be made to run in either forward or reverse direction.
3. Available in standard widths up to 84", widths in excess of 84" by special order, and lengths as required.
4. Made with 6", 9", 12" or 15" pan pitch (depending on width) to fit available head room.

PIONEER-ORO FEEDER
Capacities in tons per hour

Travel per Min.	Width of feeder						
	30"	36"	42"	48"	60"	72"	84"
10'	74	108	147	192	300	432	588
15'	112	162	222	289	450	648	888
20'	148	216	294	384	600	864	1176
25'	186	270	368	482	750	1080	1472
30'	223	324	442	577	900	1296	1768

Ask Your Feeder Salesman These Questions

1. Are pans made from special manganese steel? How thick?
2. Are pans and links cast together so they are rivetless?
3. Can manganese parts be replaced without disassembling pans?
4. Will pans support themselves without rollers?



Closely-spaced manganese steel rollers keyed to oversize shafts, prevent sagging and distortion of pans.

Note the turned-up end flanges and corrugated surface of heavy-interlocked pans; also absence of rivets.

For further details and specifications regarding full line of PIONEER *Feeders, write Pioneer Engineering Works, Inc., Minneapolis 13, Minn. (subsidiary of Poor & Company, Chicago) or see your nearest* PIONEER *Distributor.*

BUY BOTH! HIGHER OUTPUT LOWER UPKEEP

Pioneer *Continuflo* EQUIPMENT

Pioneer Engineering Works, Inc., 1515 Central Ave., Minneapolis 13, Minn.
Subsidiary of Poor & Company • Chicago
Please send information on equipment checked.

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- ☐ WASHING PLANTS
- ☐ MECHANICAL FEEDERS
- ☐ ROCK PLANTS
- ☐ BITUMINOUS PLANTS
- ☐ VIBRATING SCREENS
- ☐ JAW CRUSHERS
- ☐ APRON FEEDERS
- ☐ BUZZER SCREENS (LIGHT DUTY)
- ☐ ROLL CRUSHERS
- ☐ ORO FEEDERS
- ☐ CONTINUFLO CONVEYORS

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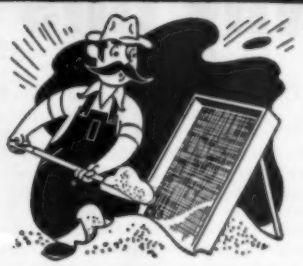
Screenings



by Ray L. Smith, Jr.

THE CHINESE make a mistake when they try to use English in the flowery, sometimes abject, way of their own language. This letter sent by a Chinese Life Insurance Company illustrates the point.

"Esteemed policy-holder:

Kindly refrain from joining illustrious ancestors while insignificant premium repose unpaid in offending pocket since meantime honorable family, not company, is holding the burlap."

Perhaps a greater menace than imagination trimmed with fantasy is this new language being favored by the teenagers. Must we now become a square or is it a solid cat and make a dig at bebop?

Something's got to be done about it or you won't be able in a few years to hire a young fellow who can write in ordinary words. Ask your youngest these days, "Where is Pop?" and you may hear, "He cut out, and ain't he the swingin'est?"

No, ye old ed hasn't already gone over to the movement. He just borrowed some of the words from Steve Allen's rewrite of "Little Red Riding Hood." At that, we might try this bebop on the pup at night—"Dig, baby, make the mostest—start flippin'."

No, we're not crazy—the kids are!

Cheez-it—The Ants Are Coming

GUESS you can't blame the Lufkin, Texas lads for getting caught with their salt trucks down. Can't expect them to be entomologists as well as road builders.

Seems they used rock salt, on an experimental basis, to stabilize a road base, and right there they made their big mistake. Hordes of huge ants, who had just finished the vegetable course, sans salt, moved onto the road hell bent on un-stabilizing it.

Apparently, except for the ant epidemic, the road was a success, but due to the ants some sections caved in. (Every time we buy a new car now, we'll wonder if there'll be any roads left to drive it on.)

Ground Glass Cure

PRESCRIPTION for A- and H-bomb radiation sickness: A shot of ground glass.

That prescription probably never will be written but the temporary inflamation caused by injections of pulverized particles of limestone quartz saved one-fifth of the animals which would otherwise have died from doses of radiation.

So, save all those old bottles and have them ground up—never can tell when you'll need a shot.

Potpourri and Succotash

Little Billie was entering school with a group of other beginners and the teacher was attempting to determine the extent of their knowledge. "And what is your name, little boy?" she inquired. "Billy Smith," was the answer. "And do you know your a-b-c's yet?" "Why, hell no!" the little fellow responded in disgust. "I've only been here 10 minutes."

The commanding officer was receiving a delegation of his men who were complaining about the food and in particular about the bread that was being issued. "Soldiers shouldn't let themselves be bothered over trifles," he admonished. "Why, I'll wager that if Napoleon had had that bread when he was in Russia he'd have eaten it with gusto." "No doubt, sir," said one of the men, "it was still fairly fresh then."

The chief constable of a small town was also an expert veterinary surgeon. One night the telephone bell rang and the constable's wife answered.

"Is that Mr. Jenkins?" asked an agitated voice.

"Do you want my husband in his capacity as a veterinary surgeon or as chief constable?"

"Both, madame," came the prompt reply. "We can't get our bulldog's mouth open and there's a burglar in it."

A farmer visiting a state mental hospital was strolling about the grounds when he came upon an inmate sprawled restfully under the shade of a tree. After a word of greeting the man sat up and eyed his visitor with considerable interest.

"What do you do for a living?" he finally asked.

"I'm a farmer."

"Farmer, huh? I used to be a farmer. Darned hard work."

"Sure is," agreed the visitor.

"Ever try being crazy?"

"Why, no," the shocked farmer replied.

"You ought to try it some time," declared the inmate as he again relaxed on the cool grass. "Beats farmin'."

"I took my girl friend out to dinner last night. We were having a lovely time until she found a bug in her soup."

"That was terrible. What did she do?"

"She cried, 'Waiter, remove this insect!' "

"Well?"

"The damn waiter threw me out."

The hotel manager discovered that a guest had departed without settling his bill, so he wrote him, saying: "My dear Mr. Black: Will you please send us the amount of your bill, and oblige," etc. By return mail came this amiable letter: "Dear Sir: The amount of my bill is $127.19. Happy to be of service. Sincerely yours."

An author and a friend were heatedly discussing a new book and found themselves at some variance as to its merits. "There's no use in your talking, Bill," said the author finally. "You never wrote a book yourself so of course you can't appreciate the fine points of one." "Oh, I don't know," retored Bill. "I never laid an egg myself, but I can spot a bad one quicker than any hen in the country."

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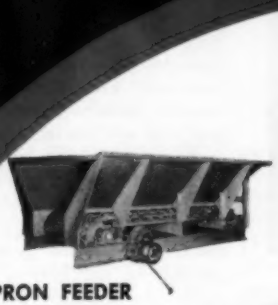
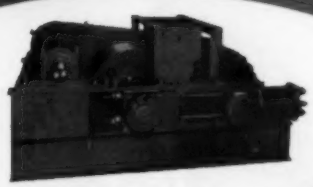
For Gravel, Quarry and Mining Operations for More Than 50 Years

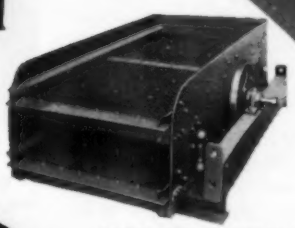
For more than fifty years, Rogers has designed and built quality equipment, embracing a complete line for the gravel, quarry and mining industries; including stationary and portable plants of all types. Rogers designs and furnishes equipment which meets your specific requirements to produce specification material. Complete information can be had by contacting your local Rogers distributor or the factory.



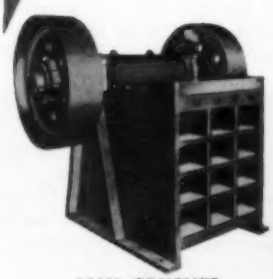
APRON FEEDER



ROLL CRUSHER

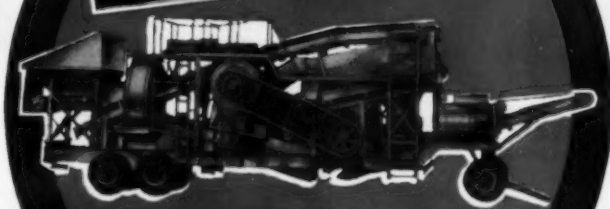


VIBRATING SCREEN



JAW CRUSHER

Write for bulletins on equipment in which you are interested.



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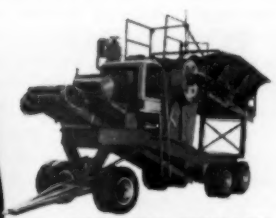
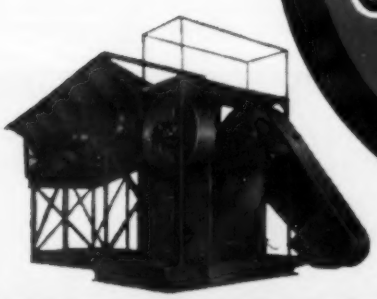
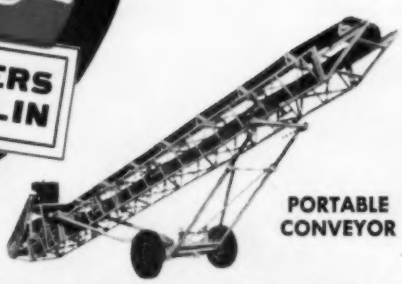


PORTABLE PRIMARY PLANT



APRON FEEDER AND CRUSHER



PORTABLE CONVEYOR

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ROGERS IRON WORKS COMPANY

ROGERS IRON WORKS COMPANY, Joplin, Missouri

Yes! Please send me information on_____

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Name_____

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the Uranium Industry

TODAY almost everyone knows something about the "bomb" and the dangers of radioactivity, but few are acquainted with the facts surrounding the extraction of uranium from the earth.

Literally hundreds of thousands of persons help produce uranium. They run the gamut from prospectors to executives, and include geologists, engineers, metallurgists, lawyers, brokers, and indirectly millions, including *you*, as a taxpayer-owner of this business.

By JOHN E. CRAWFORD

The uranium industry is concerned with the exploration for and recovery of uranium ores and concentrates from the earth's crust, and the production of uranium metal and certain refined materials required for the manufacture of nuclear weapons or for research. This is a big business, a strategic business, but for the most part an unglamorous one, not necessarily guaranteed to bring the participants high monetary profits.

Uranium is not as scarce as you might think. There is, on an average, more uranium in the earth's crust than gold, mercury, silver, antimony, bismuth, or cadmium. The problem lies in finding workable concentrations of the element, which is known to occur in more than 100 minerals, but never in pure, native form.

John E. Crawford

While 100 or more is an imposing number of uranium-bearing minerals, unfortunately only nine such minerals are known to occur in amounts sizable enough to make them of economic significance. Three of the nine are known as primary uranium ore minerals, those which have not been altered in composition or form since their solidification or precipitation. These are (1) pitchblende, an amorphous uranium oxide; (2) uraninite, a crystalline uranium oxide; and (3) davidite, a rare-earth-iron-titanium-uranium oxide.

The six secondary uranium ore minerals, formed as a result of the decomposition of the original primary mineral, are (1) carnotite, a potassium-uranium vanadate; (2) tyuyamunite, a calcium-uranium vanadate; (3) torbernite and meta-torbernite, hydrous copper-uranium phosphates; (4) autunite and meta-autunite, hydrous calcium-uranium phosphates; (5) uranophane, hydrated calcium uraninum silicate; and (6) schroekingerite, a complex hydrated sulphate, carbonate and fluoride of calcium, sodium, and uranium. The names are tongue-twisters, usually given the mineral in honor of a scientist, a town, or a region either directly or vaguely associated with its discovery.

There are more localities throughout the world being mined for uranium than would probably be suspected. In the United States alone there are probably 1,000, some admittedly small, but still mines. Listed on page 73 are areas in which economic deposits have been found in this country.

In the United States, until recently, private uranium exploration and mining represented largely the efforts of individuals and small companies. With the encouragment of the Atomic Energy Commission, "old timers" and newcomers alike set out with Geiger counters and, more recently, with scintillation counters on prospecting ventures in the Colorado Plateau area of Colorado, New Mexico, Utah, and Arizona. This area

Prospecting with car-mounted nuclear detection equipment.

Courtesy of Willys Motors, Inc.

Here a portable nuclear detection instrument is being employed in prospecting for uranium.

Courtesy of Willys Motors, Inc.

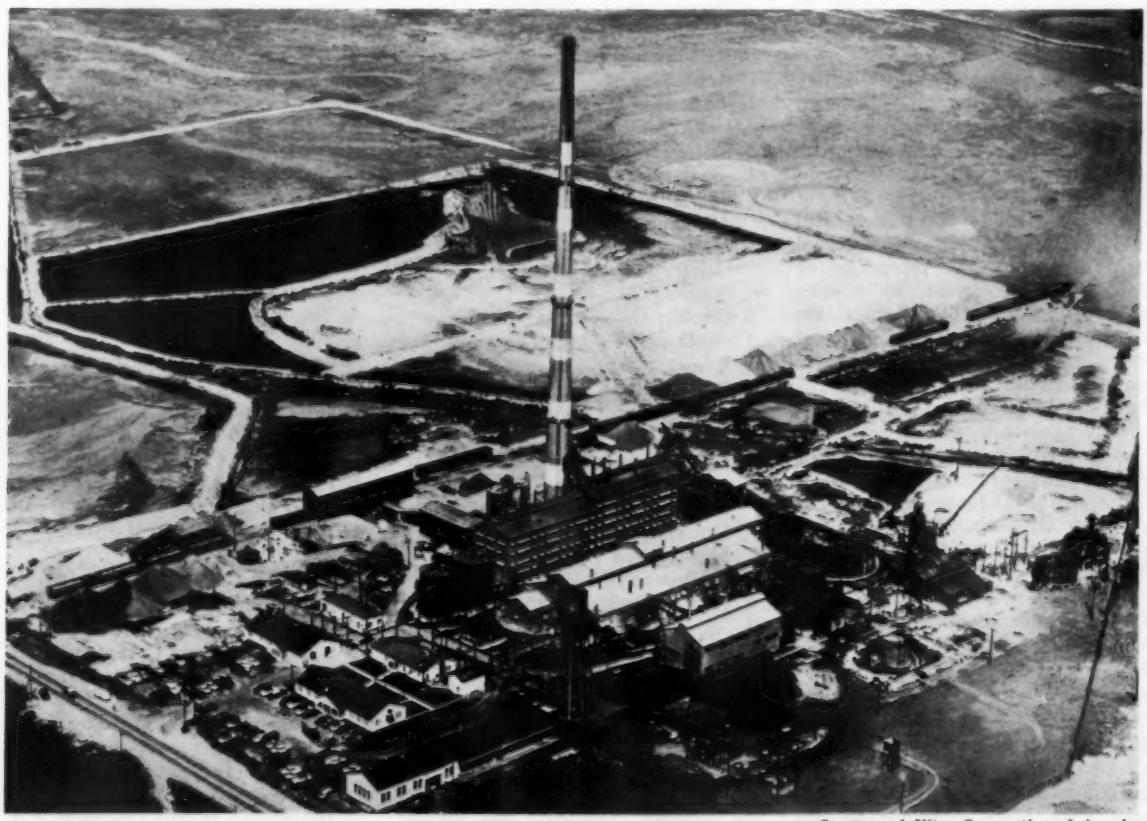
Locality	Areas	Mineralization
California	Kern County	Autunite and torbernite
Colorado	Front Range	Pitchblende
Colorado, Utah, Arizona, and New Mexico	Colorado Plateau	Carnotite, torbernite, uranophane, and pitchblende
Florida	Bone Valley formation	Uranium associated with fluorapatite
Montana	Boulder area	Torbernite, autunite, and pitchblende
Arizona	Globe district	Carnotite, tyuyamunite, uranophane, and uraninite
Nevada	Lander County	Torbernite
New Mexioc	Colorado Plateau (Colorado district)	Uranophane and tyuyamunite
Pennsylvania	Mauch Chunk	Carnotite
South Dakota and Wyoming	Black Hills	Carnotite
Utah	Marysvale district	Autunite, torbernite, schroeckingerite, uranophane, and pitchblende
Utah	Colorado Plateau (San Rafael Swell area)	Uranium in asphaltites
Washington	Spokane Indian Reservation	Autunite and torbernite
Wyoming	Powder River basin	Carnotite
Wyoming	Wind River Basin	Uranocirite, phosphuranylite, and uranospinite

was favored by the government and prospectors alike, because it was known that uranium minerals occured and had been mined there.

In the early 1900's carnotite was recovered on the Plateau for its radium and vanadium content. A few large companies participated in the early post-World War II uranium exploration and mining work, but it was not until extensive occurrences of uranium were found by Charles A. Steen and Vernon Pick in 1952 that the old, established mining organizations realized some reason to expect profits, and threw their trained exploration and mining crews into the uranium bedlam.

New groups, including major oil and metal companies, are entering the field more rapidly than one can revise his lists; and the individual and small organizations which had the Plateau almost entirely to themselves in 1950 and before must now face stiff competition in searching out and recovering the lenses and pods of carnotite and disseminated uraninite of the Morrison, Chinle, and Shinarump strata, geologic formations of the Colorado Plateau. Mergers and rumors of mergers of small companies holding promising and not-so-promising claims were rife during 1954, but in 1955 the efforts of the industry were stabilized.

The government, through the Defense Minerals Exploration Administration of the Department of Interior, will financially assist an individual, group, or company in doing exploratory work for uranium. You may receive a loan for 75 percent of your total exploration costs, provided that you are able to show that your prospecting has resulted in the discovery of mineralized ground worthy of a detailed exploration program. You must, of course, prove ownership of the property on which you wish to explore, or have a leasehold, located claim, or other interest giving you the right of possession for



An air view of Vitro's uranium milling plant at Salt Lake City, Utah.

Courtesy of Vitro Corporation of America

Courtesy of American Ledue Uranium Co.

Drilling a claim on the Colorado Plateau.

Courtesy of Vitro Minerals Corp.

Uranium ore mining in the Gas Hills area of Wyoming with a 2-cu. yd. dragline.

the length of time needed to conduct an exploration program under DMEA contract and to protect the government's interest thereafter. Should your exploration work determine an economic deposit of uranium, you are expected to return the government loan out of proceeds received in mining the deposit. Should you fail to find something of value, the government stands to lose its 75 percent and you the remaining 25 percent of the costs.

To date (December 31, 1955) some 495 applications for assistance on uranium exploration projects have been received by DMEA; 109 contracts have been approved, and 21 of these resulted in discoveries of economic uranium occurrences. Remember, though, that this financial help is not for the prospector or wildcatter! You must, as a rule, show evidence of possible uranium mineralization on the property, and some indication of your initiative and good faith. This is a gamble, at best, but the odds should not be completely against a possible return of the government's investment. For further information about DMEA, write to the Defense Minerals Exploration Administration, U. S. Department of Interior, Washington 25, D. C.

To assist the individual prospector, the Federal Bureau of Mines will test for radioactivity and identify, free of charge, small samples of material submitted for examination. The Bureau has conducted this program of sample testing on behalf of the Atomic Energy Commission for several years; as many as 2,000 samples have been examined in one month by the Bureau's regional facilities, and the service may have turned up some promising occurrences. If you have found some material that you believe may contain uranium and wish to have it tested, you may send it to one of the following Bureau of Mines offices:

U. S. Bureau of Mines
Box 492
Albany, Oreg.

U. S. Bureau of Mines
1605 Evans Avenue
Reno, Nev.

U. S. Bureau of Mines
1600 East First South Street
Salt Lake City 1, Utah

U. S. Bureau of Mines
Box 4097, University Station
Tucson 5, Ariz.

U. S. Bureau of Mines
Denver Federal Center
Building 20
Denver, Colo.

U. S. Bureau of Mines
School of Mines Campus
Rapid City, S. D.

U. S. Bureau of Mines
P. O. Box 136
Rolla, Mo.

U. S. Bureau of Mines
107 Mines Experiment Building
University Campus
Minneapolis 14, Minn.

U. S. Bureau of Mines
College Park, Md.

U. S. Bureau of Mines
Box 1
University, Ala.

The Bureau of Mines also offers the public information about uranium prospecting, mining, and nuclear energy applications. Your questions receive the personal attention of qualified geologists and mining engineers experienced in the field of uranium. The U. S. Geological Survey and the Atomic Energy Commission also receive many such inquiries, which are replied to as quickly and competently as possible.

The Colorado Plateau, of course, is not the only domestic area from which uranium is being recovered, but it is by far the most significant. Some uranium ore is mined in Arizona, California, Pennsylvania, Montana, Nevada, South Dakota, Washington, and Wyoming, and non-Colorado Plateau areas of Arizona, Colorado, and Utah. While the deposits are economic, their geologic extent has not been proven. The development of the properties and surrounding area may prove extensive reserves of uranium ore, or the deposits may be found to be so small as to be of little real future economic importance. It has been stated that there were in 1955 more than 800 mines producing uranium ore on the Colorado Plateau. Many of these mines were probably small, employing up to 15 men and utilizing exceedingly simple mining techniques. The following domestic companies, however, are some which are prominent in their uranium mining operations on the Plateau:

Anaconda Copper Mining Company, Jackpile Mine and Woodrow Mine, near Grants, N. M.

Climax Uranium Company, properties on the Colorado Plateau, near Grand Junction, Col.

Haystack Mountain Mining & Development Company, Section 19 Mine and Poison Canyon Mine, near Grants, N. M.

Homestake Mining Company, Lit-

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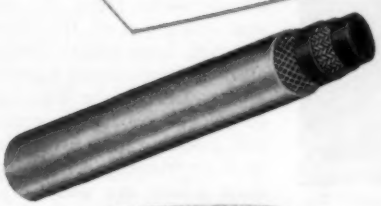

AIR Extra lightweight, highly flexible hose for heavy duty work. Resists weather damage and abrasion. Non-porous tube of oil resistant rubber compound. Rugged Neoprene cover. Ideal for almost any hose installation.

FIRE Resilient, flat-folding hose saves space and gives long service in interior fire protection. Highly flexible and resistant to cracking. Leak-proof tube bonded to strong single jacket cover. Recommended for institutions, offices, ships, etc.

STEAM Many times stronger than wrapped fabric hose for general steam-handling jobs. Also lighter, more flexible and kinkproof for easier handling. Steel wire and glass reinforcing insures extra safety. Resists high pressures up to 388° F.

WELDING No twisted, tangled lines. Two lines are securely bonded together to form a single, safe hose unit. Kink-free and resistant to welding gases. Stands up to lots of dragging across rough surfaces. Especially effective on portable welding dollies.

WATER For long wear and outstanding value, this easy-to-handle hose has what you need. Reinforced with multiple plies of high tensile yarn, it takes higher than usual working pressures. Cover stands up to weather extremes without cracking or peeling.

Save time and money. Call your Quaker-Quaker Pioneer distributor first, *when you need hose or other industrial rubber products. You'll find him prompt, dependable.*

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Courtesy of Union Carbide Nuclear Co.

A truck loaded with uranium ore is on the way to a processing mill; a mine car is entering the mine to pick up more ore. This mine is in the Colorado Plateau region.

tle Beaver Mine and La Sal Mine, near Moab, San Juan County, Utah.

The Atlas Corporation, Hidden Splendor Mine and others, on the Plateau.

Union Carbide Nuclear Company, about 50 properties in Colorado and Utah section of the Plateau.

Utex Exploration Company, Mi Vida Mine, near Moab, San Juan County, Utah.

Vanadium Corporation of America, about 40 properties in Colorado section of the Plateau.

Uranium mining techniques do not vary greatly from techniques generally used in mining other materials. The method which will produce the most ore at the lowest cost, in a reasonably safe manner, is usually acceptable. Successful uranium mining operations in the Western United States have been by open-pit, shaft, and adit or tunnel methods.

The predominant method on the Colorado Plateau has been the adit or tunnel operation following a mineralized "showing" inward from a canyon wall or sloping ground. Such an operation is simple, cheap, and can be handled competently by as few as two men with jackhammers and wheelbarrows. The famous, multimillion-dollar Mi Vida Mine of Charles Steen's Utex Mining Corporation in the Lisbon Valley, near Moab, Utah, started as an inclined tunnel.

On the other hand, the big Jackpile Mine (probably the largest producer in the United States) of the Anaconda Company, near Grants, N. M., is an open-pit stripping operation, where thousands of tons of earth are moved daily. The Golden Cycle Corporation conducts mining on deep-shaft principles at Atkinson Mesa, Montrose County, Colo. working in underground drifts some 635 ft. below the surface. It is probably one of the deepest uranium mines in the United States. Foreign uranium mining operations are believed to be nearly all underground types.

The uranium ore which is mined on the Colorado Plateau is not milled at the mine site, as is often the case with copper, lead, zinc, and other metallic ores, but trucked to an Atomic Energy Commission or private buying station maintained in conjunction with an industry-operated mill. Such mills, which are actually hydrometallurgical plants, are constructed by a company after negotiating and effecting a contract with the AEC. A mill isn't cheap; it may cost well over $1,000,000. The mill under construction by Uranium Reduction, Inc., at Moab, Utah, will reportedly cost some $8,000,000.

The mill operators, therefore, are not small companies. These are organizations skilled in the treatment of raw material for the recovery of valuable metal or mineral products; and it was their technical ability and financial stability which ultimately won them a contract with the government to process uranium ore. Uranium concentrates are recovered at the mill by one of several processes after the ore is solubilized by either acid or carbonate leaching techniques.

There are presently nine uranium mills in operation which concentrate the uranium from the sandstones and limestones of the Plateau and material from other Western areas, and five more under construction.

New areas in the West which may commence producing uranium ores will probably have available to them AEC or industry-owned buying stations where ore will be purchased and stockpiled, if it is of acceptable grade and character. The Commission enters into a contract for the construction of a mill only when it is certain that sufficient ores are available of a given type to warrant the presence of a mill.

The uranium ore producer, however, is guaranteed a market and minimum prices, and does not face the problem of what to do with the material, provided, of course, that it meets specifications as described in AEC Circular 5. The circular is available from the Commission.

Another domestic source of uranium, one possessing an extremely large tonnage of low-grade uranium, is in the economic phosphate deposits of Florida. By-product recovery of uranium from phosphatic raw material during the course of the production of phosphatic fertilizers and chemicals is possible. Two phosphate companies in Florida and one in Illinois are currently recovering some by-product uranium. Here, again, the profit may not be spectaular but the long-term demand appears good, and recovery know-how could be invaluable if an emergency were to arise and we should need to utilize all our resources.

Mill	Location
Anaconda Co.	Bluewater (Grants), N. M.
Climax Uranium Co.	Grand Junction, Colo.
*Continental Uranium, Inc.	La Sal, Utah
Galigher Co. (Government owned)	Monticello, Utah
Kerr-McGee Oil Industries, Inc.	Shiprock, N. M.
Union Carbide Nuclear Co.	Rifle, Colo.
Union Carbide Nuclear Co.	Uravan, Colo.
Vanadium Corporation of America	Durango, Colo.
Vanadium Corporation of America	Naturita, Colo.
Vitro Chemical Co.	Salt Lake City, Utah
*Uranium Reduction Co.	Moab, Utah
*Mines Development, Inc.	Edgemont, S. D.
*Rare Metals Corporation of America	Tuba City, Ariz.
*Trace Elements Corporation	Maybell, Colo.

*Under construction.

Companies which are extracting uranium from phosphatic material include the following: International Minerals & Chemical Corp. at its Bonnie Chemical Plant, Bartow, Fla.; the Virginia-Carolina Chemical Corporation, Nichols, Fla.; and the Blockson Chemical Company, Joliet, Ill. The Texas City Chemicals Co., Inc., has operated a recovery plant at its facilities constructed in 1954 at Texas City, Tex.

Uranium concentrates produced at Western mills, the Florida-type material, and imported ores and concentrates from Australia, the Belgian Congo, Canada, Union of South Africa, and Portugal are shipped to either of two large refineries called Feed Materials Centers. These centers recover a bright orange uranium trioxide (UO_3) and reduce it to a brown uranium dioxide (UO_2) powder, which is then converted into uranium metal or processed at other locations into uranium hexafluoride.

To produce uranium metal the uranium oxide is first transformed into uranium tetrafluoride, more frequently referred to in the uranium business as "green salt." The salt is relatively harmless insofar as its radio-activity is concerned, but the fluorine used in making the compound is a difficult substance to handle. It is toxic, instable, eats through most container materials, and is one of the most unpredictable and dangerous elements the chemical engineer must work with. Uranium ingots, produced from green salt through a series of fairly routine but detailed metallurgical steps, are heavier than lead, have the appearance of nickel, and are harmless. The ingots are next rolled into bars and cut into slugs, which are shipped to a reactor site, and sealed in aluminum cans.

Uranium hexafluoride is prepared from the uranium tetrafluoride; hexafluoride contains a great amount of fluorine and is therefore more corrosive and more dangerous to produce and transport. Uranium hexafluoride is a final product which is prepared in facilities contiguous to the gaseous diffusion plants.

The Mallinckrodt Chemical Works at St. Louis, Mo., is one of the two uranium refiners. The $17,000,000 installation there is being expanded at a cost of $6,500,000. Additional facilities being constructed at nearby Weldon Spring will cost $33,300,000.

The National Lead Company of Ohio operates the other refinery, a $78,000,000 affair at Fernald, Ohio. This plant, too, is being increased in size, at a cost of $20,100,000.

Through the feed material stage the handling of uranium is not particularly dangerous, insofar as its radioactivity is concerned. True, you woudn't want to eat it, roll in it, or otherwise contaminate yourself with the material, but its radioactivity would not be sufficient to cause bodily injury unless one were exposed to the substance for unreasonably long periods of time. Of more concern would be the danger of injury from acids and other chemical agents used in the recovery and refining processes.

The stages of mining, concentrating, and refining uranium are not unusual. True, new methods and techniques of treating the raw material were developed, but general mining, metallurgical, and chemical know-how are readily able to cope with the problems as they arise. However, once the uranium metal leaves the Feed Materials Centers at Fernald and St. Louis, the nuclear scientist becomes the man-of-the-hour. We no longer deal in chemical techniques but nuclear techniques, a new and somewhat frightening concept of matter. Rapid, unseen reactions take place, many times more difficult to control than chemical reactions which take place in the concentration and refining stages.

The natural uranium metal, containing only one part uranium-235 to 140 parts uranium-238, is a reactor fuel. After being fabricated into suitable shapes at a Feed Material Center, the metal is shipped either to the AEC's Hanford, Wash. plant, operated by the General Electric Company, or the Savannah River Plant, Aiken, S. C., operated by E. I. du Pont de Nemours, at these plants it is placed in production reactors, and some of the uranium-238 content is transformed into fissionable plutonium.

The chain-reacting uranium-235 component of the natural uranium rods or slugs disintegrates or fissions when the aluminum-sheathed slugs are placed in the nuclear reactor and the proper conditions are effected. Some of the neutrons which form the center of the atom, liberated in the fission process, strike other uranium-235 atoms causing their disintegration. This is the chain reaction that is necessary to keep the reactor "alive."

Some random neutrons, however, will also strike the more prevalent uranium-238 atoms, transforming them into fissionable plutonium. The physicist calls this "transmutation," and it would take him many pages to describe adequately what actually happens to bring about the change. The quantity of plutonium formed in a single fuel element is very minute and must be extracted by detailed chemical processes. This entails removing the altered uranium metal from the reactor; and because the slugs are dangerously radioactive, they must be handled by remote-control equipment, sometimes under as much as 30 ft. of water and always behind sizable lead and concrete barriers.

Large expenditures have been made for equipment and construction at the two plutonium production plants. The Hanford plant originally cost about $350,000,000. After World War II it underwent a $200,000,000 expansion, and in 1953 an additional $166,600,000 construction program was commenced. The Savannah River project cost approximately $1,400,000,000. Obviously, plutonium is not cheap!

Uranium hexafluoride, the other product, is transported to a facility for the extraction of fissionable uranium-235 from non-fissionable uranium-238. The ratio of one part U-235 to 140 parts U-238 is maintained in the uranium-fluoride mixture, a solid at room temperature, and a gas at slightly elevated temperatures. The separation is conducted in a so-called gaseous diffusion process at plants operated by Union Carbide and Carbon Corporation at Oak Ridge, Tenn., and Paducah, Ky., and by the Goodyear Atomic Corporation, a subsidiary of Goodyear Tire & Rubber Company, in Pike County, Ohio. The process is based on the minute difference in weight of the two uranium atoms which make up natural uranium and involves countless miles of special processing equipment.

The uranium-hexafluoride gas is pumped through thousands of compartments containing perforated barriers. Because the uranium-235 is slightly (but almost immeasurably) lighter than uranium-238, it will pass through the screens more rapidly than the heavier atom. However, because the difference in the weights is so very slight and because of the nature of the material, it must be passed and repassed through hundreds of miles of piping, barriers, pumps, etc. The passage of a given amount of uranium hexafluoride through the gaseous diffusion system is measured in months.

To make matters more complicated, the extreme corrosiveness of the fluorine present means that all equipment must be custom made of

(*Continued on page* 117)

Another ON THE SPOT Report

Stockbridge Stone's New Calera Plant

overcomes quarrying and water problems in producing chemical-grade fluxstone

By ROY L. PECK

LAST August the Stockbridge Stone Company, jointly owned by Birmingham Slag Company, Birmingham, Ala., and Lambert Bros., Inc., Knoxville, Tenn., put into operation its new fluxstone production plant, located at Calera, Ala., some 35 miles south of Birmingham.

Designed to produce 500 t.p.h. of chemical-grade stone, the plant is an example of efficiency of operation and ability to vary the six gradations produced, with the minimum of manual labor. Features include the use of a movable stacker paralleling the live storage piles; three all-steel screening towers containing wet screens, and secondary and tertiary crushers, from which stacker-conveyors serve 5,000-ton finished product storage piles; complete visual material movement control from a central point; and complete interlocking of all crusher and conveyor drives.

Despite two major problems—a geologic formation in the quarry which presented problems of overburden removal and difficulty of cleaning the product in the first lift, and a lack of an adequate and economical volume of wash water—the company is already well on its way to overcoming these obstacles and attaining its designed production.

The Birmingham Slag Company is well known for its many varied operations in Alabama and Georgia. In addition to the Calera operation, these include the following: six slag-producing plants, located at Woodward, Fairfield, Ensley (2), East Thomas, and Alabama City, Ala.; ready-mixed concrete and concrete products plants at Birmingham and Alabama City, Ala.; and an asphalt plant at Fairfield, Ala. The Atlanta Aggregate Company, Atlanta, Ga., and the Montgomery Roquemore Gravel Company, Montgomery, Ala., are subsidiary companies.

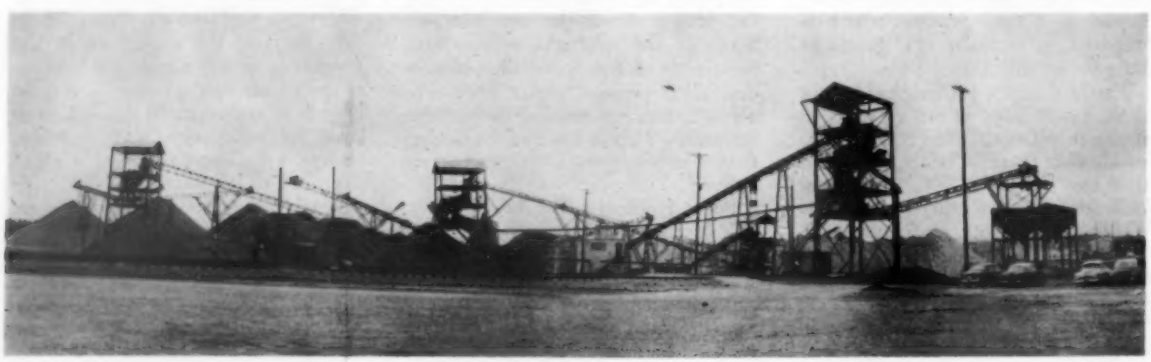
Stockbridge Stone Company at present also operates granite quarries at Stockbridge, and Kennesaw, Ga., a dolomitic limestone quarry at White, Ga., and two portable crushing plants which can be moved to supplement operations at any point. Lambert Bros. operate several stone quarries located primarily in eastern and central Tennessee.

Geological Formation

Considerable area in addition and adjacent to the present quarry area at Calera was acquired by the company when it was determined to produce chemical grade limestone at that point two years ago. The geological formation in the area is basically Newala limestone, overlaid by Lenoir and underlaid by Longview limestone. When the quarry was opened last year, it was found that the upper 15 to 18 ft. of the deposit was weathered to an extent greater than had been expected from the 500-ft.-interval test drilling of the whole area which had been done. This portion was removed to get at a suitable grade of stone beneath. Overburden varied from 14 to 20 ft. in depth, the lower portions having penetrated deeply into the bedding planes of the upper portion of the deposit. The strike runs northeast and southwest, with a southeastern dip of about 25 degrees, and operations can be continued along this strike for over 1½ miles.

The high-calcium was not homogeneous, and at the outset intermediate strata of this limestone posed a problem of getting enough surge capacity from which to produce a consistent chemical grade. Requirements of the main customer, the Tennessee Coal and Iron Company —as to silica and high-calcium content—were high, and close chemical control was necessary, especially as to the latter. This customer required 95 percent or better of $CaCo_3$, not over 4.0 percent of $MgCo_3$, and 1.02 percent of SiO_2.

Between the Lenoir and Longview formations there are four strata of high-calcium from 80 to 100 ft. thick, separated by 50- to 80-ft. strata of dolomitic limestone. In quarrying the high-calcium (65 to 70 percent of the deposit) some dolomitic limestone (30 to 35 percent) must be removed. Two faces



A general view of the Stockbridge Stone Company fluxstone plant at Calera, Ala., showing the screening and loading towers and stockpiles.

have been opened up on the high-calcium and the dolomitic will be left for later quarrying. It is planned to quarry an area of approximately 750 by 2,400 ft. in the first lift before a second lift is initiated.

Overburden

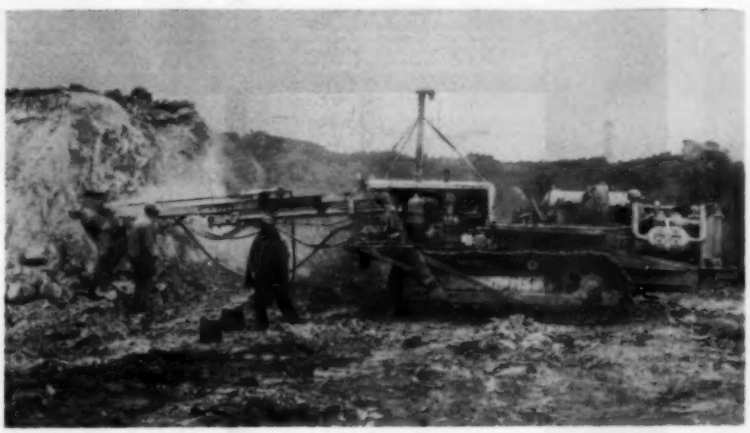
Removal of overburden is by outside contract. As is shown in the photographs of the area now being quarried, this removal is expensive work, as the top layer of clay, earth, and loose gravel must be literally "fingered out" from the fissures between outcropping weathered strata of limestone. The contractor doing this work is presently using Insley backhoes equipped with small channel-shaped scoops for the removal of this material. This work proceeds at a slow rate, which is sometimes barely ahead of the blasting and shovel removal of stone. This condition will be alleviated considerably as quarrying proceeds and the dirty stone is out of the way. Removal by means of hydraulicking was considered, but that method was discarded when it was apparent that overburden materials would be washed down deeper into the bedding planes of the limestone. Also, such a method would require a large amount of water, and the disposal of such a quantity from the quarry area would be an additional problem.

A water supply for the plant has been provided by the construction of impounding dams to accumulate run-off during the rainy season and the development of deep wells. The water is efficiently reclaimed for reuse by means of screens, settling tank, dewatering classifiers, and settling ponds. 1,500 to 2,000 g.p.m. is being used in the plant. Wet screening is followed throughout the entire plant with the exception of the screening done in Tower No. 3, in which 1-in. and ¾-in. separations are made.

Quarrying

Bench drilling is done with two Ingersoll-Rand drill wagons carrying 4-in. drifters mounted on Caterpillar D-6 crawler tractors. Bits are of 2-in. and 1¾-in. diameters. A pattern of holes of about 6-ft. spacing on an 8-ft. face is followed, if possible. Two Ingersoll-Rand 600 c.f.m. compressors driven by GM No. 671 engines provide the air for the operations of the drilling equipment. With this equipment holes can be sunk

Equipment cleaning out the overburden under difficult circumstances. Note the small scoop on the backhoe for reaching into clefts in the stone.



Bench drilling with 4-in. drifters mounted on crawler tractors. Such drilling is required by the 25-degree dip of the deposit.

Shovel loading a 15-ton rear-dump truck in the quarry. Note the amount of overburden removal and the stockpiling stackers in the background.

MORE CARRY IN YOUR

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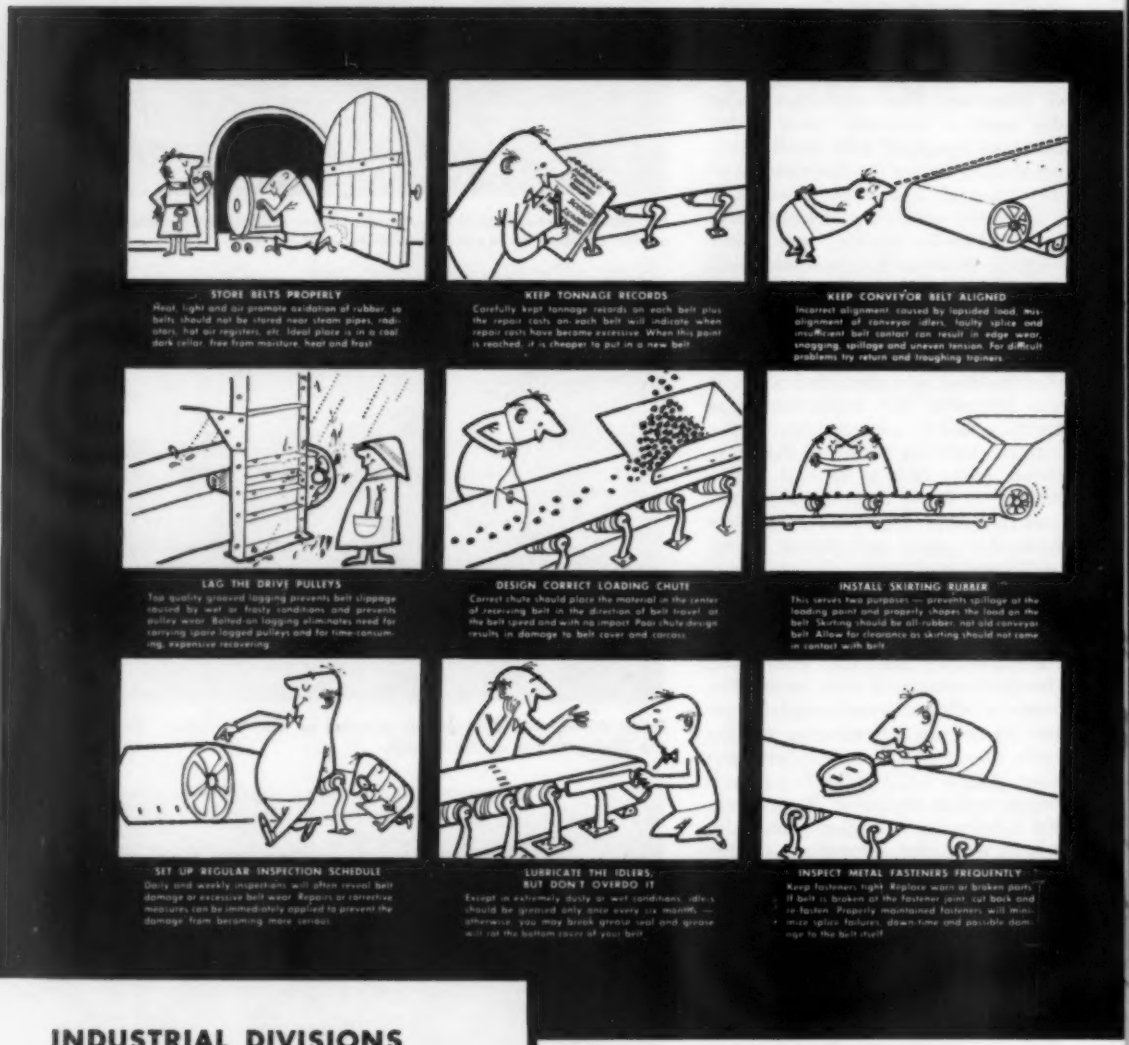
STORE BELTS PROPERLY
Heat, light and air promote oxidation of rubber, so belts should not be stored near steam pipes, radiators, hot air registers, etc. Ideal place is in a cool dark cellar, free from moisture, heat and frost.
KEEP TONNAGE RECORDS
Carefully kept tonnage records on each belt plus the repair costs on each belt will indicate when repair costs have become excessive. When this point is reached, it is cheaper to put in a new belt.
KEEP CONVEYOR BELT ALIGNED
Incorrect alignment caused by lopsided load, misalignment of conveyor idlers, faulty splice and insufficient belt contact can result in edge wear, snagging, spillage and uneven tension. For difficult problems try return and troughing troiners.
LAG THE DRIVE PULLEYS
Top quality grooved lagging prevents belt slippage caused by wet or frosty conditions and prevents pulley wear. Bolted-on lagging eliminates need for carrying spare lagged pulleys and for time-consuming, expensive recovering.
DESIGN CORRECT LOADING CHUTE
Correct chute should place the material in the center of receiving belt in the direction of belt travel, at the belt speed and with no impact. Poor chute design results in damage to belt cover and carcass.
INSTALL SKIRTING RUBBER
This serves two purposes — prevents spillage at the loading point and properly shapes the load on the belt. Skirting should be all-rubber, not old conveyor belt. Allow for clearance as skirting should not come in contact with belt.
SET UP REGULAR INSPECTION SCHEDULE
Daily and weekly inspections will often reveal belt damage or excessive belt wear. Repairs or corrective measures can be immediately applied to prevent the damage from becoming more serious.
LUBRICATE THE IDLERS, BUT DON'T OVERDO IT
Except in extremely dusty or wet conditions, idlers should be greased only once every six months — otherwise, you may break grease seal and grease will rot the bottom cover of your belt.
INSPECT METAL FASTENERS FREQUENTLY
Keep fasteners tight. Replace worn or broken parts. If belt is broken at the fastener joint, cut back and re-fasten. Properly maintained fasteners will minimize splice failures, down-time and possible damage to the belt itself.

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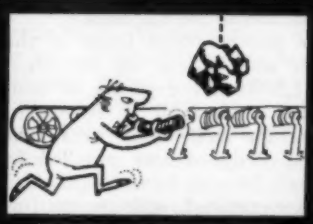
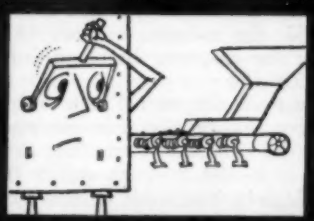


USE IMPACT IDLERS AT LOADING POINTS
Some of the shock of impact at such points is absorbed by these idlers, resulting in less strain both on the carcass and covers of the belt.



MAKE USE OF AUTOMATIC SWITCHES
These switches will shut down the belting in case it breaks, in case of excess slipping on the drive pulley, or if the feeders or chutes "choke up."

REPAIR IMMEDIATELY CONVEYOR BELT DAMAGE
Unattended damage to the belt permits dirt and moisture to attack the fabric. Also, if the use of a damaged belt is continued, the impact and the sliding passage of injured areas over idlers and pulleys will enlarge the damage. The damaged spot should be cut out soon as noticed, and new rubber vulcanized into the hole.

Which is the best belt for you?

For Mining *(Metallic and Nonmetallic)*

Maltese Cross for especially severe service. Ajax for general heavy duty service, and Conservo for general light duty service. Exceptionally severe special conditions may require use of specially designed Hewitt-Robins belts such as Shock Pad, CR-50 and CR-70, Raynile and Super-Raynile, Ajax Underground and Monarch Neoprene fire-resistant belting.

For Metal Processing

Maltese Cross for exceptionally severe service. Ajax for general heavy duty service, and Monarch Neoprene for oily service. Maltese Cross Fiberglas Hot Material, Maltese Cross Fabric-type Hot Material and Hewitt Hot Service are especially designed for hot material handling.

For Public Utilities

Monarch Neoprene for oily service, Maltese Cross Hot Material and Hewitt Hot Service for hot material handling. Maltese Cross for especially severe service and Ajax for general heavy duty service.

For Food Processing

Canners and Packers and Hewlite for food handling, Monarch Neoprene for oily service, Ajax Rufftop, Conservo Rufftop and Conservo Transport for package handling. Monarch, Ajax and Conservo for grain and feed handling.

For Materials Handling

Conservo for portable conveyors. Ajax Rufftop, Conservo Rufftop, Conservo Transport and Hewlite for packaging conveyors.

For Chemical Processing *(Including Pulp and Paper)*

Maltese Cross for exceptionally severe service, Ajax for general heavy duty service, and Conservo for general light duty. Maltese Cross Fiberglas Hot Material, Maltese Cross Fabric-type Hot Material and Hewitt Hot Service are especially designed for hot material handling.

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your local HR Industrial Supply Distributor or write to our executive offices in Stamford, Connecticut.

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OFFICES: STAMFORD, CONN.

at the rate of about 2 f.p.m., with one man on each drill. Two shovels are used for loading the stone, one a Northwest 80-D with a 2½-cu. yd. bucket, the other a Bucyrus-Erie 54-B with a similar bucket. A Lorain Model 72 crane carries a 6,500-lb. dropball for secondary reduction in the quarry.

Stone is loaded into two 15-ton Euclid No. 27, rear-dump trucks and five 15-ton Mack trucks, also rear-dump types. The haul to the primary crusher at present averages about 1,700 ft. per round trip; and this distance will not change appreciably because it is planned to quarry the area presently exposed before going into a second lift.

The road to the crusher is difficult going, ending on a ramp of waste rock built up above the main level of ground. Trucks negotiate this route ending with a backup to the hopper above the crusher, which is located centrally with respect to the deposit.

Cleanup around the shovels is by means of an Allis-Chalmers HD-15 bulldozer. Other movable equipment used in the quarrying operation include a 1½-ton GMC No. 303 truck for general service and a Ford 500 chassis on which is mounted a water tank, an air compressor and light plant, and a gasoline supply drum. A Ford 700 truck carries equipment to repair tires, and fender emergency service. A Caterpillar road grader is used for general maintenance of roads on the property.

Primary Crusher

At the primary crushing point stone goes first into a Telsmith 48-in. by 14-ft. apron pan feeder mounted above the primary crusher, which is a Telsmith 42- by 48-in. jaw crusher having a closed side setting of 7½ in. and a capacity of 500 t.p.h. The crusher is driven by a 200-hp. 600 r.p.m. Allis-Chalmers slip ring motor operating at 2,300 v. current, with power transferred to the crusher by means of a Gates V-belt drive. A 5-ton P & H hoist, equipped with a jam hook, is mounted above the crusher. Discharge of the primary crusher is onto conveyor No. 1, which is 36-in. wide and 585 ft. long, and has a capacity of 525 t.p.h.

This belt conveyor carries minus 8-in. stone to the movable stacker, feeding material onto belt conveyor No. 2 on the stacker through a tripper arrangement operating along the track support of the stacker frame. Several belt pickers are now employed along No. 1 conveyor in picking off lumps of clay or other deleterious materials before they go into the live storage piles served by the stacker. This chore will be eliminated as cleaner stone is obtained.

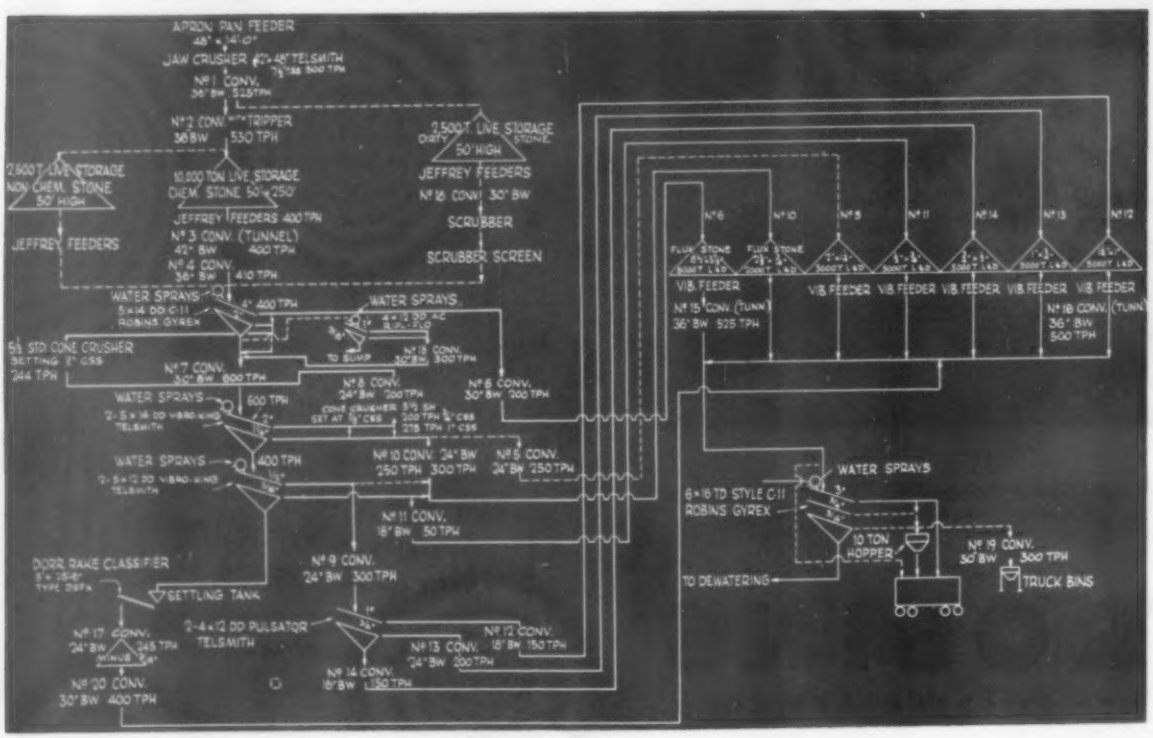
Schematic flow sheet of operations at the Stockbridge plant.

Live Storage Piles

Chemical stone is stored in a 10,000-ton storage pile built up by the discharge of stacker belt No. 2. (Width, length, and tonnage capacities of all 21 conveyor belts used in the plant are given in the accompanying conveyor specification table.) The stacker is a steel frame structure carrying conveyor No. 2. It is supported by a steel subframe carried by four railway car wheels on a double track 533 ft. long. The inclination of the stacker permits it to build up piles 50 ft. in height, with the centerline 65 ft. north of and parallel to the rail lines.

The present travel limits of the stacker also include the formation of a 2,500-ton storage pile of non-chemical grade stone at the eastern end of the live storage area. The stacker, designed and installed by Transall, Inc., of Birmingham, Ala., is motor-operated, with current furnished by a cable through a sliding contact. The travel motor is a 10-hp. 1,800 r.p.m. TEFC Crocker-Wheeler; the coupling, Liquid Drive TF-267; the reducer, a Jones 135 DHA; the magnetic brake, a G-E CR-9516-462.

The reclaiming tunnel built under the live storage piles has concrete block walls and a concrete floor and roof. It is 480 ft. long, and 9 ft. 4 in. high by 8 ft. inside in cross section. Jeffrey feeders with capacities



of 400 t.p.h. permit a flow of stone from any point along the storage pile, through gates spaced at 46-ft. intervals, onto conveyor No. 3. This tunnel is reinforced with rectangular steel frames set at intervals of 5 ft. along its length.

There is also an arrangement for taking stone from the non-chemical grade storage pile through a Jeffrey feeder onto this same No. 3 conveyor, which discharges onto belt No. 4. This is the belt which takes the discharge of belt No. 3, through a transfer point at the east end of the reclaiming tunnel, and it carries materials up to the top of screen tower No. 1. All three screen towers are built of steel frames, but have no enclosing sidewalls. All have metal corrugated steel roofs.

CONVEYOR SPECIFICATIONS

Conveyor No.	Belt Width Inches	Belt Manufacturer	Length Feet	Tonnage T.P.H.	Motor Hp.	Motor R.P.M.
1	36	Goodrich	585	525	40	1800
2	36	Goodrich	148	525	40	1800
3	42	Goodrich	428	400	15	1800
4	36	Quaker	194	410	40	1800
5	24	Quaker	79	250	10	1800
6	30	Quaker	158	200	15	1800
7	30	Quaker	234	600	15	1800
8	24	Quaker	143	200	15	1800
9	24	Quaker	228	300	30	1800
10	24	Quaker	84	300	15	1800
11	18	Quaker	116	50	5	1200
12	18	Quaker	104	150	7½	1800
13	24	Quaker	77	200	7½	1800
14	18	Goodrich	102	150	7½	1800
15	26	U. S.	293	525	75	1800
16	36	Manhattan	370	500	20	1800
17	24	Goodrich	121	245	7½	1800
18	30	Manhattan	22	300	5	1800
19	30	Quaker	69	300	10	1800
20	30	Quaker	122	400	10	1800
21	24	U. S.	59	245	10	1800

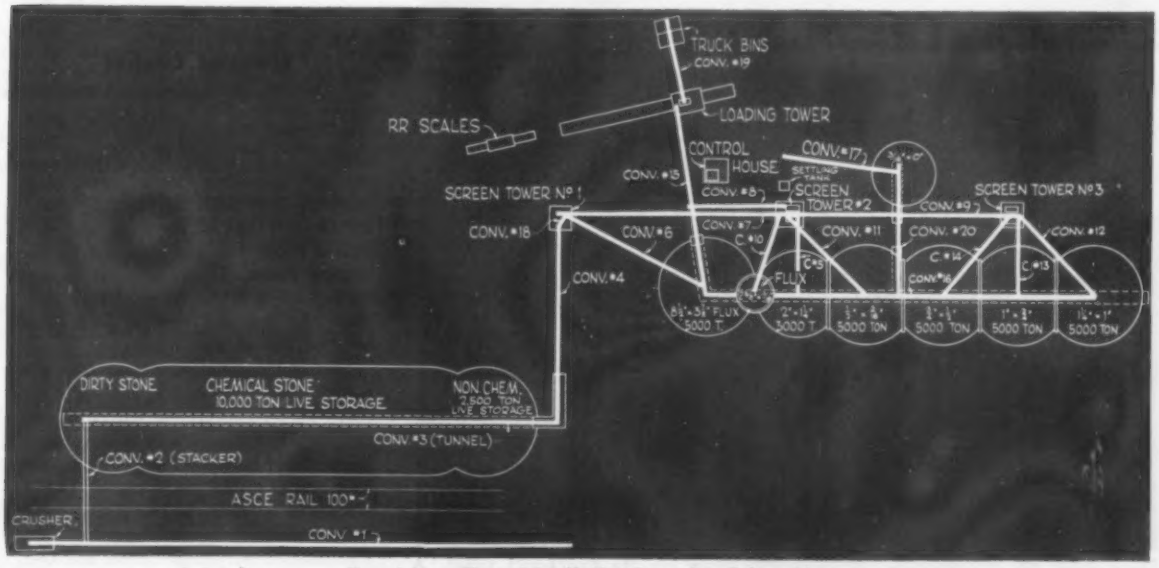
Screening Equipment

As is seen in the accompanying photographs of the plant, the screening and secondary crushing operations are installed in a series of three screening towers, set in a line parallel to the finished fluxstone and aggregate stockpiles. Materials go to these stockpiles from the various screens according to the gradation and range of sizes in each, by means of stacker-conveyor belts. (See the accompanying drawing and schematic flow sheet of the plant operations). Photographs of individual towers, showing screens and crushers contained in each, and of the conveyors carrying various grades of stone away from these screens, indicate the relative complexity of the whole operation necessitated to furnish 6 sizings of stone.

Closed circuits permit switching from 8- by 3-in. and 2⅝- by 3/16-in. chemical stone production to production of aggregates in the 2- by 1¼-in., 1¼- by 1-in., 1- by ¾-in., ¾- by ½-in., ½- by 3/16-in., and 3/16- by 0 sizes. This may be done by simply switching the various gates in the tunnel and line of production. Most of the finished stock piles have 5,000-ton combined live and dead storage capacities.

As previously mentioned, wet screening is used throughout the plant, with the exception of the screens in tower No. 3, where two Telsmith double-deck Pulsator screens with 1-in. top and ¾-in. bottom-deck cloth is used to screen the discharge of conveyor No. 9. Water-sprayed screens used elsewhere consist of a 5- by 14-ft. Hewitt-Robins Gyrex double-deck Model C-11 screen (4-in. top, 2-in. bottom), a 4- by 12-ft. Allis-Chalmers double-deck Ripl-Flo (1-in. top and 3/16-in. bottom), four Telsmith (two 5- by 14-ft. and two 5- by 12-ft.) double-deck Vibro-Kings (2-in. top and 1½-in. bottom, and ½-in. top and 3/16-in. bottom, respectively).

Minus 3/16-in. material from the last mentioned screens is carried to a 10- by 10-ft. Eagle settling tank, the overflow from which goes into a 5- by 28-ft. 6-in. Dorr Type DSFX rake classifier. The discharge of this unit is carried by belt No. 17 into the minus 3/16-in. to 0-in. stockpile. A short-tunnel under this stockpile contains belt No. 20, which reclaims this fine material onto the main finished tunnel belt conveyor



Plan of Stone Plant of Stockbridge Stone Co., Calera, Ala.

The primary crusher house, showing the ramp in the rear for truck dumping into the hopper. The overhead framework supports a 15-ton hoist and hook.

The movable stacker holding conveyor No. 2 for placing minus 8-in. stone in live storage piles. Note the tripper on conveyor No. 1 (foreground).

Screen tower No. 1, showing belt No. 4 feeding stone into the double-deck screen. A standard 5½-in. cone crusher is installed in the base.

No. 16. The latter runs under all finished product stockpile gates and vibrating feeders. All reclaimed finished products on belt No. 16 is transferred inside the west end of the tunnel to belt No. 15, which conveys each size as wanted for shipping, to the loading tower north of the stockpiles.

The reclaiming tunnel running under the finished product stockpiles, 419 ft. in length and 8 ft. high by 7½ ft. wide, is of reinforced concrete construction. This tunnel also runs under the 2,000-ton flux silo holding the 2⅝- by 3/16-in. stone, which comes to that point off conveyor No. 10 from screening tower No. 2. By reference to the schematic flowsheet of the whole operation, other screening procedures, closed circuits for re-grinding, etc., can be ascertained.

Secondary Crushing

Material off the first double-deck Gyrex screen (4-in. top and 2-in. bottom cloth), discharges into a 5½-ft. Symons standard cone crusher having a 2-in. closed side setting and a capacity of 244 t.p.h. Discharge from this crusher goes *via* conveyor No. 7 to screen tower No. 2 for further separation and disposal into finished stockpiles.

From this same screen tower another crusher receives material for further reduction. This is a 5½-ft. Symons short head cone crusher, with a ⅞-in. c.s.s. Output can be varied here by changing this c.s.s.; a ¾-in. opening produces 200 t.p.h. and a 1-in. opening producing 275 t.p.h. Material from this crusher is returned to the circuit *via* belt No. 8. Both the above crushers are powered by G-E 200-hp., 600 r.p.m. 2,300 v. slip ring motors.

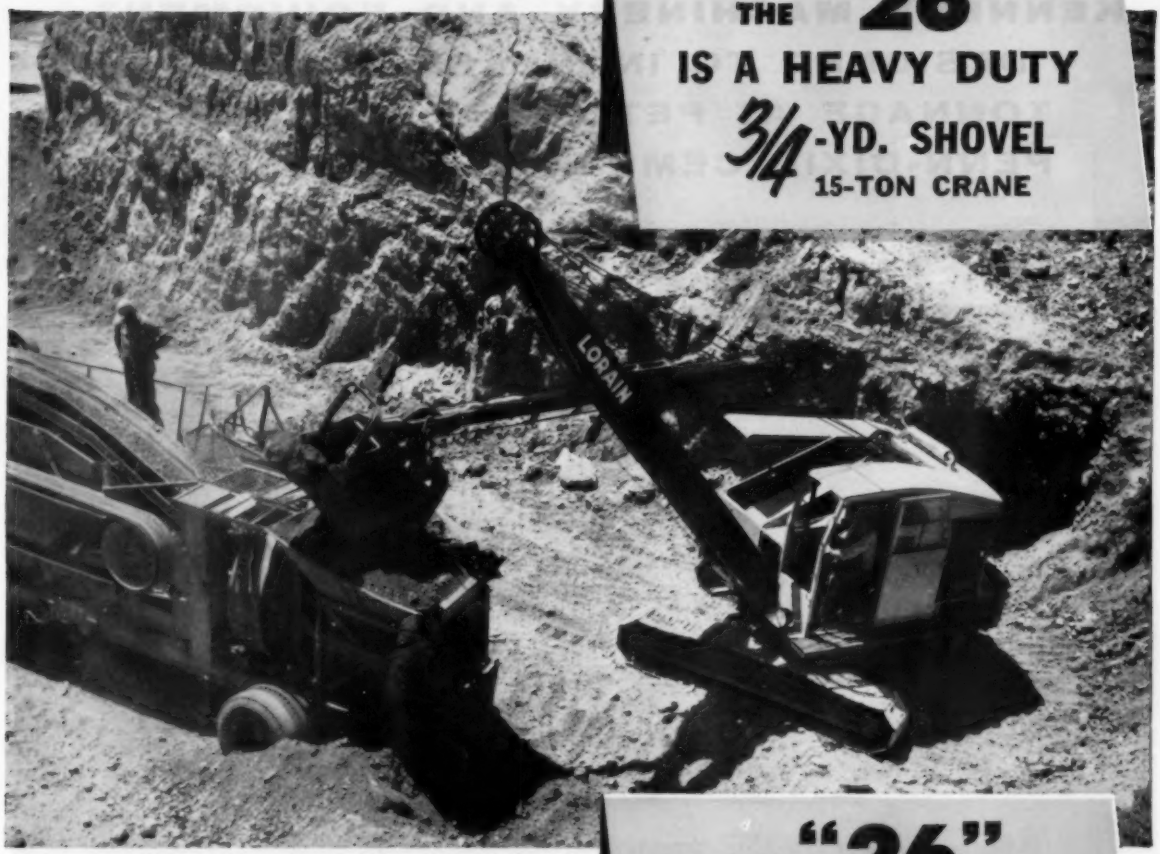
Material Control

A control house is located between screen towers No. 1 and 2 in a position which permits the operator (about 40 ft. above the ground) to see all conveyor belts, bins, and stackers, and also the loading operations. All motor controls are tied into a control board installed in the control room. These are interlocked on any integral line of material movement, so that the flow of stone can be shut off at any time.

Cutler-Hammer motor controls are on all motors up to 100 hp. and G-E controls on motors of this size and larger. Electrical power is purchased from the Alabama Power Company and comes to the plant site at 13,000 volts; it is then reduced to 2,400 volts before it is distributed to any equipment. All transformers are G-E and are of various capacities.

LORAIN SAYS . . .

THE "26" IS A HEAVY DUTY 3/4-YD. SHOVEL 15-TON CRANE



THE "26" "CONSTANTLY STANDS TERRIFIC DIGGING STRAIN"

The best test for any shovel is on the job. That's where product claims must be proved . . . and that's why Partner and Manager C. R. Davis of the Albany Gravel Co., Albany, Mo., says far more in these words than any claims Lorain may make . . . *"Our Lorain-26 is used for digging natural gravel from a solid deposit. It stands terrific digging strain constantly and takes hard digging abuse exceptionally well."* This is just one owner's reaction to the new Lorain-26. See your Thew-Lorain Distributor. He can show you Lorain-26's at work.

ALBANY GRAVEL CO. SAYS...

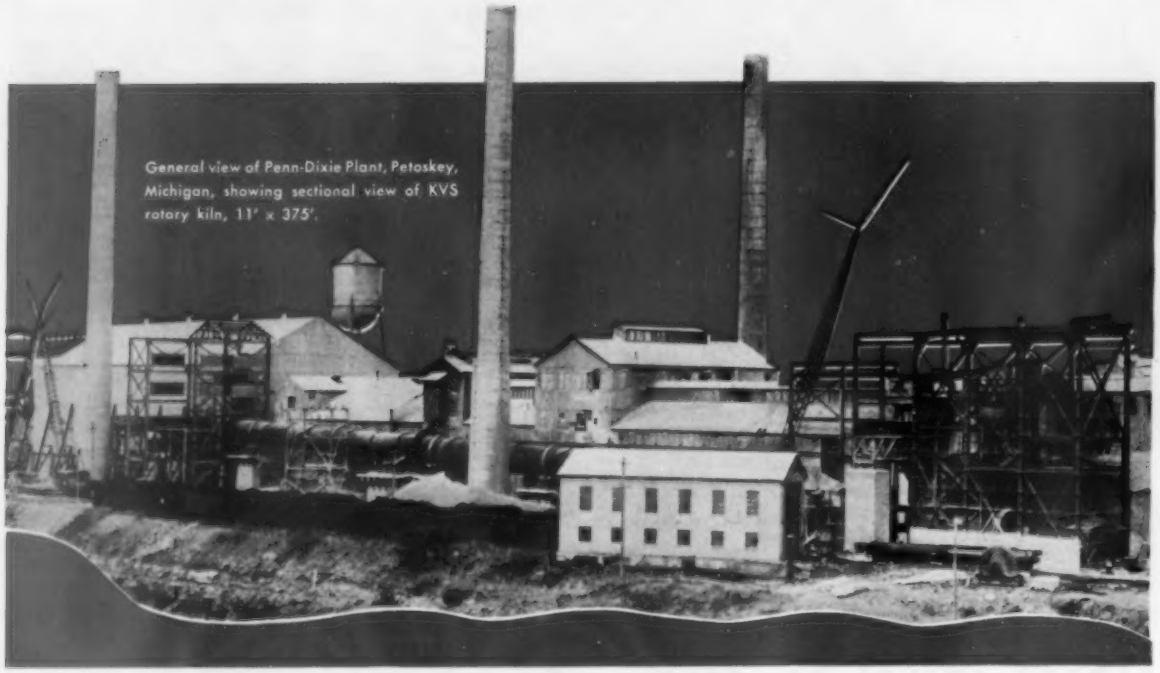
AND HERE'S WHY—this combination of features found in no other machine!

- *New Lorain "E-Z" Controls • "Big Look"—larger, wider cab for greater operator comfort • "Hydra-Ease" power control of crawler steering, tread lock, house lock and shifting of swing-travel jaw clutches.*
- *Hydraulic Coupling power take-off for no-stall, no-shock, "never-say-die" smooth application of power • No digging shocks transferred to mechanism.*
- *5 identical, Interchangeable Shoe Clutches • Bigger clutches with 18% more capacity, plus new, easier action, longer-life design • 19 anti-friction bearings on power shafts and clutch drums.*
- *19 ft. shovel boom for maximum reaches—powerful, independent cable crowd • Much greater weight—over 47,000 lbs. as a shovel • 15-ton crane capacity with 2-piece pin-connected boom • Power load lowering standard • Ability to back-down the load • Third Drum available.*
- *Newly-designed, sturdier, wider, 2-speed Crawlers with 29-inch wide drop-forged treads • 2 crawler speeds in both directions • Oil-enclosed crawler travel mechanism • 4-way, positive Tread & Travel Lock—fully enclosed.*
- *Truss-type Turntable Bed • Hook Rollers—front 2 are on anti-friction bearings.*

THE THEW SHOVEL CO., LORAIN, OHIO

THEW LORAIN®

KENNEDY MACHINERY AND EQUIPMENT DESIGNED TO INCREASE CEMENT TONNAGE AT PETOSKEY PLANT OF PENN-DIXIE CEMENT CORPORATION



General view of Penn-Dixie Plant, Petoskey, Michigan, showing sectional view of KVS rotary kiln, 11' x 375'.

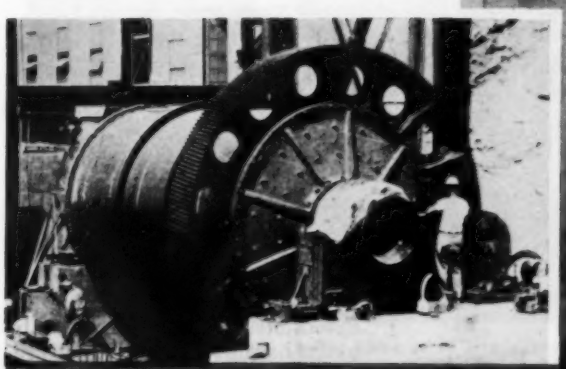
Machinery and equipment for a modern plant... designed and manufactured by KVS to meet the rigid requirements of the Penn-Dixie Cement Corporation for their Petoskey, Mich. Plant.

The additional machinery includes, two-compartment Clinker Grinding Mill . . . Three compartment Raw Wet Grinding Mill . . . Rotary Kiln, 11 ft. x 375 ft. . . . Complete with auxiliary equipment. The installation of this new machinery will increase the annual rated capacity of this fine plant by 54%.

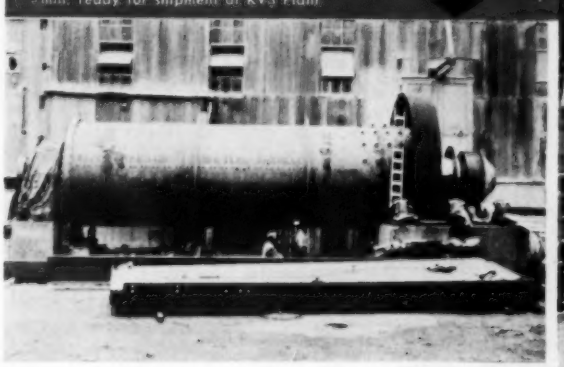
The KVS trade mark on any type of machinery used in the manufacture and processing of cement, lime, aggregates, non-metallic ores, etc., is synonymous with top quality. In use the world over, KVS Machinery and Equipment has an enviable reputation for peak capacities, economical operation, and low maintenance costs.

KENNEDY PRODUCTS

- Coolers, Dryers
- Preheaters, Deheaters
- Belts, Conveyors
- Pneumatic Transport Systems
- Asbestos Plants
- Complete Lime Plants
- Complete Cement Plants
- Gyratory Crushers
- Swing Jaw Crushers
- Tube Mills
- Ball & Rod Mills
- Vibrating Screens
- Rock Feeders
- Air Swept Tube Mills
- Rotary Kilns
- Steam Generators
- Complete Aggregate Processing Plants
- Waste Heat Boilers
- Pulverized Coal Firing Systems



KVS 11 ft. x 20 ft. Clinker Grinding mill being installed at Petoskey Plant.



9 ft. x 30 ft. Three-compartment wet grinding mill, ready for shipment at KVS Plant

KVS 11 ft. x 375 ft. Rotary Kiln in process of erection at Petoskey Plant.

Let our engineers show you how KVS Machinery and Equipment will increase the output, efficiency and operating profits of *your* plant.

SEND FOR BULLETINS DESCRIBING KVS MACHINERY AND EQUIPMENT.

KENNEDY-VAN SAUN

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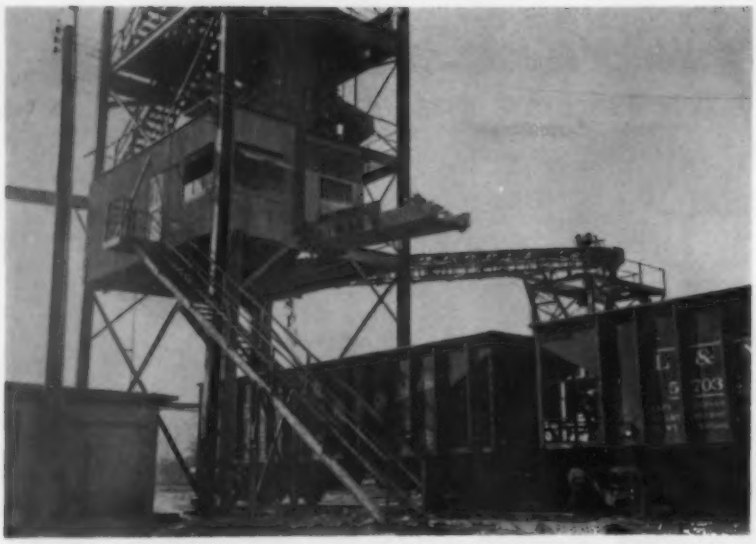


A closeup of the loading operation into railroad cars, showing the control house and bins. The scale house is at the left (front).

In the central plant three 200 kv.-a. transformers take the 2,400-volt current down to 440 volts for screens. Three more 75 kv.-a. transformers furnish 440-volt power for the apron feeder, the shop, and conveyors No. 1 and 2. Several other 25 kv.-a. and smaller transformers furnish 220- and 110-volt power for lighting in office, laboratory, screens, and other points throughout the plant.

Water Supply

As previously mentioned, all water is used in closed circuit, conveyed by flume from the wet screens and settling tank, the classifier, and other points to settling basins where water is impounded for re-use. At the deep well, a 20-hp. Peerless pump, pumps water into a pond shown in an accompanying picture. Several Gould pumps located at the man-made lake circulate water from that point back into the pipelines serving the screens. Two other Gould pumps, driven by 100-hp. Crocker-Wheeler motors, move water from a settling basin west of screen tower No. 1.

Loading

The main loading conveyor No. 15 receives all materials to be shipped from the reclaiming conveyor No. 16, which runs under the finished product stockpiles, and takes this material up to the top of the loading tower, about 300 ft. north. A Merrick Weightometer installed on belt No. 15 records all material shipped.

In the loading tower belt No. 15 discharges onto a 6- by 16-ft. Hewitt-Robins Style C-11 triple-deck Gyrex screen, having 3-in., ¾-in., and 3/16-in. deck cloth. Material off the upper deck is chuted into railroad cars, and material off the lower decks either to railroad cars or to belt No. 19 for transfer to the 4-compartment truck-loading bins 70 ft. beyond the railroad tracks.

On the loading track of the plant a Howe two-section straight-level track scale is installed. This unit is of 75-ton capacity, having a dead-rail feature. It is equipped with a Streeter-Amet recorder for automatic weighing. Details of the loading operation are shown in accompanying pictures. The plant is serviced by the Louisville & Nashville Railroad.

Miscellaneous

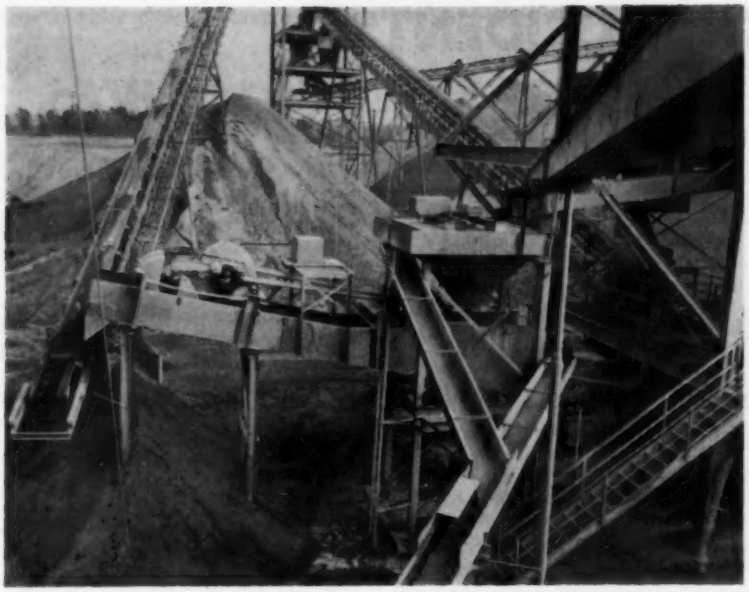
The entire operation at Calera requires the services of about 35 persons in addition to executive, super-

(*Continued on page* 98)

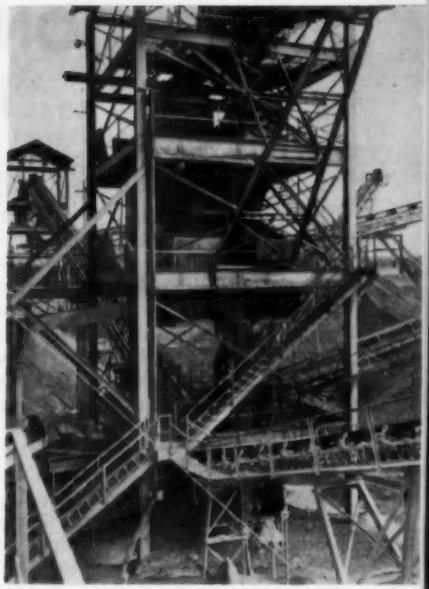
Left: Two inspectors, E. R. Jones (left) and S. G. Milazzo, at work in the laboratory, which is fully equipped for all testing.

Below, left: James A. Carnathan, general superintendent; William E. Hinkle, plant engineer; and J. H. Pigford, chief engineer.

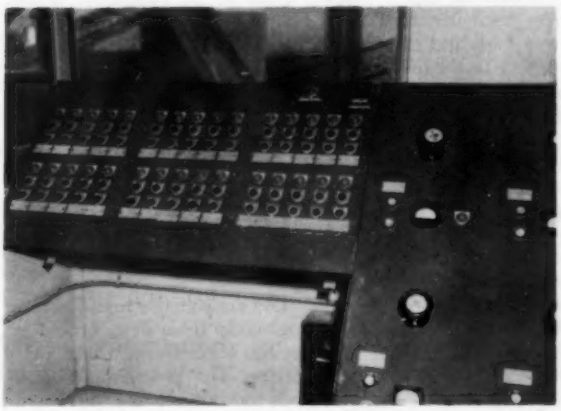
Below: Buster Parker, superintendent; Carl Morrow, plant foreman; and F. C. Snow, quarry foreman.



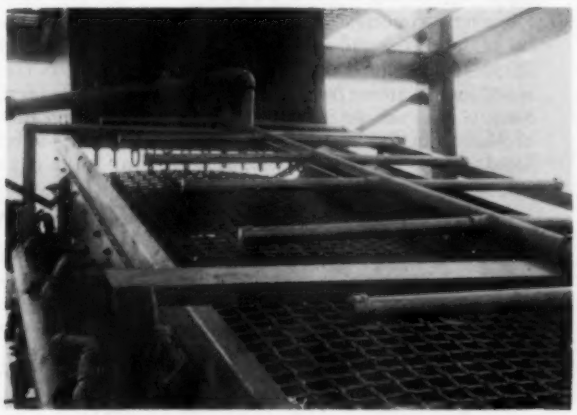
The settling tank and the rake classifier taking minus 3/16-in. stone from the screen. Note the water flume (foreground) and the fines stockpile (background).



Screen tower No. 2, showing screens, stackers to finished product piles, and the secondary crusher.



The interior of the control room, from which the operator has an unobstructed view of all movable equipment in plant.



No. 1 scalping screen at the top of screen tower No. 1. Screen cloth is 4-in. in the top deck and 2-in. in the bottom deck.

The settling pond for re-use of water. This picture was taken during the construction of the plant and railroad sidetrack.

Looking toward the loading tower. Belt No. 15 and the water flume are in the left foreground. The settling pond is at the left (rear).

PREVENTION OF ACCIDENTS IN THE USE OF *EXPLOSIVES* *

THE prevention of accidents in the use of explosives is a result of careful planning and observance of the best known practices. The explosives user must remember that he is dealing with a powerful force and that various devices and methods have been developed to assist him in directing this force. He should realize that this force, if misdirected, may either kill or injure both him and his fellow workers.

WARNING

All explosives are dangerous and must be handled and used with care either by or under the direction of competent, experienced persons. It is the responsibility of all persons who handle explosives to know and to follow all approved safety procedures.

It is obviously impossible to include warnings or approved methods for every conceivable situation. A list of suggestions to aid in avoiding the more common causes of accidents is set forth herein. Additional information is available in the Institute of Makers of Explosives Publications listed: *Standard Storage Magazines* (Pamphlet No. 1); *American Table of Distances* (Pamphlet No. 2); *Safety First Rules for Handling, Storing, Delivering and Shipping Explosives* (Pamphlet No. 5); *Safety in the Handling and Use of Explosives* (Pamphlet No. 17); *Radio Frequency Energy—A Potential Hazard in the Use and Transportation of Electric Blasting Caps* (Pamphlet No. 20); *Explosives in Agriculture,* and *How to Destroy Explosives.* When in doubt, consult the manufacturer.

DEFINITIONS

1. The term "explosives" as used herein includes any or all of the following: dynamite, black blasting powder, pellet powder, blasting caps, electric blasting caps, and detonating fuse.

2. The term "electric blasting cap" as used herein includes both instantaneous electric blasting caps and all types of delay electric blasting caps.

3. The term "primer" as used herein means a cartridge of explosives in combination with a blasting cap or an electric blasting cap.

INSTRUCTIONS AND WARNINGS

When transporting explosives . . .

1. DO obey all federal, state and local laws and regulations.

2. DO see that any vehicle used to transport explosives is in proper working condition and equipped with a tight wooden or non-sparking metal floor, with sides and ends high enough to prevent the explosives from falling off. The load in an open-bodied truck should be covered with a waterproof and fire-resistant tarpaulin. Wiring should be fully insulated, so as to prevent short circuiting, and at least two fire extinguishers should be carried. The truck should be plainly marked, so as to give adequate warning to the public of the nature of the cargo.

3. DON'T permit metal, except approved metal truck bodies, to contact cases of explosives. Metal, flammable, or corrosive substances should not be transported with explosives.

4. DON'T allow smoking or unauthorized persons in the vehicle.

5. DO load and unload explosives carefully.

6. DO see that other explosives are separated from blasting caps and/or electric blasting caps where it is permitted to transport them in the same vehicle.

When storing explosives . . .

7. DO store explosives in accordance with federal, state, or local laws and regulations.

8. DO store explosives only in a magazine which is clean, dry, well ventilated, reasonably cool, properly located, substantially constructed, bullet- and fire-resistant, and securely locked.

9. DON'T store blasting caps, electric blasting caps, or primers in the same box, container, or magazine with other explosives.

10. DON'T store explosives, fuse, or fuse lighters in a wet or damp place, or near oil, gasoline, cleaning solutions or solvents, or near radiators, steam pipes, stoves, or other sources of heat.

11. DON'T store any sparking metal tools in an explosives magazine.

12. DON'T smoke or have matches, open lights, or other fire or flame in or near an explosives magazine.

13. DON'T allow leaves, grass, brush, or debris to accumulate within 25 ft. of an explosives magazine.

14. DON'T shoot into explosives or allow the discharge of firearms in the vicinity of an explosives magazine.

15. DO consult the manufacturer if nitroglycerin from deteriorated explosives has leaked onto the floor of a magazine. The floor should be desensitized by washing thoroughly with an agent approved for that purpose.

When using explosives . . .

16. DON'T use sparking metal tools to open kegs or wooden cases of explosives. Metallic slitters may be used for opening fiberboard cases, provided that the metallic slitter does not come in contact with the metallic fasteners of the case.

17. DON'T smoke or have matches, open lights, or other fire or

*Approved by the Institute of Makers of Explosives, September 30, 1955.

SUGGESTIONS FOR MINIMIZING POISONOUS GAS HAZARDS FROM USE OF EXPLOSIVES

1. Use the largest diameter cartridge of explosive that is consistent with the work to be done.
2. Don't use explosives that are obviously deteriorated or damaged.
3. Explosives should not be removed from the cartridges.
4. Do not overcharge.
5. Do not add paper, or other combustible material, to the charge.
6. Avoid all conditions that may cause burning rather than detonation of the explosives.
7. In wet work always use explosives having adequate water resistance and fire the blast as soon after loading as practicable.
8. Confine the charge with incombustible stemming.
9. Provide adequate ventilation and make sure that the air is directed to the working places.
10. Make frequent tests to be sure that the air used for ventilation is free from carbon monoxide or other dangerous gases.
11. Spray the muck pile with water.
12. Allow the maximum practicable time after blasting before returning to the face.

flame nearby while handling or using explosives.

18. DON'T place explosives where they may be exposed to flame, excessive heat, sparks, or impact.

19. DO replace or close the cover of explosives cases or packages after using.

20. DON'T carry explosives in the pockets of your clothing or elsewhere on your person.

21. DON'T make up primers in a magazine, or near excessive quantities of explosives, or in excess of immediate needs.

22. DON'T insert anything but fuse in the open end of a blasting cap.

23. DON'T strike, tamper with, or attempt to remove or investigate the contents of a blasting cap or an electric blasting cap, or try to pull the wires out of an electric blasting cap.

24. DON'T allow children or unauthorized or unnecessary persons to be present where explosives are being handled or used.

25. DON'T handle, use, or be near explosives during the approach or progress of an electrical storm. All persons should retire to a place of safety.

26. DON'T use explosives or blasting equipment that are obviously deteriorated or damaged.

27. DON'T attempt to reclaim or use fuse, blasting caps, electric blasting caps, or any other explosives that have been water soaked, even if they have dried out. Consult the manufacturer.

When drilling and loading . . .

28. DO carefully examine the face or rock before drilling to determine the possible presence of unfired explosives. Never drill into explosives.

29. DO check the bore hole carefully with a wooden tamping pole or measuring tape to determine its condition before loading.

30. DON'T stack surplus explosives near working areas during loading.

31. DO cut from the spool the line of detonating fuse extending into a bore hole before loading the remainder of the charge.

32. DON'T load a bore hole with explosives after springing (enlarging the hole with explosives) or upon completion of drilling without making certain that it is cool and that it does not contain any hot metal, or burning or smoldering material. Temperatures in excess of 150 deg. F. are dangerous.

33. DON'T spring a bore hole near another hole loaded with explosives.

34. DON'T force cartridges or any explosives into a bore hole or past any obstruction in a bore hole.

35. DON'T force a blasting cap or an electric blasting cap into dynamite. Insert the cap into a hole made with a punch designed for the purpose.

36. DON'T slit, drop, deform, or abuse the primer.

37. DON'T connect blasting caps, or electric blasting caps to detonating fuse except by methods recommended by the manufacturer.

When tamping . . .

38. DON'T tamp dynamite that has been removed from the cartridge.

39. DON'T tamp with metallic devices of any kind. Use wood tamping tools with no exposed metal parts except non-sparking metal connectors for jointed poles. Avoid violent tamping. Never tamp the primer.

40. DO confine the explosives in the bore hole with sand, earth, clay, or other suitable incombustible stemming material.

41. DON'T kink or injure fuse, or electric blasting cap wires, when tamping.

When shooting electrically . . .

42. DON'T uncoil the wires or use electric blasting caps during dust storms or near any other source of large charges of static electricity.

43. DON'T uncoil the wires or use electric blasting caps in the vicinity of radio-frequency transmitters except at safe distances. Consult the manufacturer or the Institute of Makers of Explosives pamphlet on *Radio Frequency Hazards.*

44. DO keep the firing circuit completely insulated from the ground or other conductors such as bare wires, rails, pipes, or other paths of stray currents.

45. DON'T have electric wires or cables of any kind near electric blasting caps or other explosives except at the time and for the purpose of firing the blast.

46. DO test all electric blasting caps, either singly or when connected in a circuit, using only a blasting galvanometer specifically designed for the purpose.

47. DON'T use in the same circuit either electric blasting caps made by more than one manufacturer, or electric blasting caps of different style or function even if made by the same manufacturer, unless such use is approved by the manufacturer.

48. DON'T attempt to fire a circuit of electric blasting caps with less than the minimum current specified by the manufacturer.

49. DO be sure that all wire ends to be connected are bright and clean.

50. DO keep the electric cap wires or leading wires short-circuited until ready to fire.

When shooting with fuse . . .

51. DO handle fuse carefully to avoid damaging the covering. In cold weather warm slightly before using to avoid cracking the waterproofing.

52. DON'T use short fuse. Never use less than 2 ft. Know the burning speed of the fuse and make sure you have time to reach a place of safety.

53. DON'T cut fuse until you are ready to insert it into a blasting cap. Cut off an inch or two to insure a dry end. Cut fuse squarely across with a clean sharp blade. Seat the fuse lightly against the cap charge and avoid twisting after it is in place.

54. DON'T crimp blasting caps by any means except a cap crimper designed for the purpose. Make certain that the cap is securely crimped to the fuse.

55. DO light fuse with a fuse lighter designed for the purpose. If a match is used, the fuse should be slit at the end and the match head held in the slit against the powder core. Then scratch the match head with an abrasive surface to light the fuse.

56. DON'T light fuse until sufficient stemming has been placed over the explosive to prevent sparks or flying match heads from coming into contact with the explosive.

57. DON'T hold explosives in the hands when lighting fuse.

In underground work . . .

58. DO use permissible explosives only in the manner specified by the United States Bureau of Mines.

59. DON'T take excessive quantities of explosives into a mine at any one time.

60. DON'T use black blasting powder or pellet powder with permissible explosives or other dynamite in the same bore hole in a coal mine.

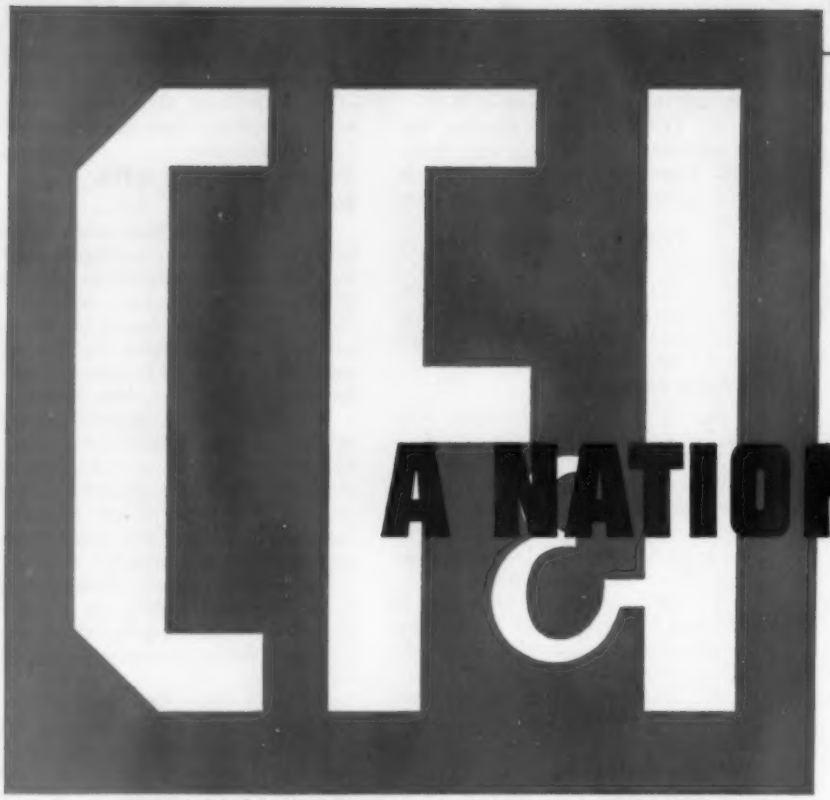
Before and after firing . . .

61. DON'T fire a blast without a positive signal from the one in charge, who has made certain that all surplus explosives are in a safe place, all persons and vehicles are at a safe distance or under sufficient cover, and adequate warning has been given.

62. DON'T return to the area of any blast until the smoke and fumes from the blast have been dissipated.

63. DON'T attempt to investigate

(*Continued on page* 98)



A NATIONWIDE

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Since the turn of the century, CF&I has grown from a regional steel company into one of the nation's largest and most progressive producers of steel and steel products. These go into many industries and are sold throughout the country.

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Blast Furnaces and Open Hearths producing pig iron, ingots, blooms, billets and rods.

CF&I Buffalo, New York
Blast Furnaces and Open Hearths producing pig iron, ingots, blooms, billets and rods.

CF&I Claymont, Delaware
Open Hearths producing ingots and steel plate.

CF&I Roebling, New Jersey
Open Hearths producing ingots, blooms, billets and rods.

CF&I Brooke, Pennsylvania
Blast Furnaces producing basic, Bessemer, foundry, malleable and low phosphorus pig iron.

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The quality of CF&I steel products is firmly controlled since the requirements of each product determine the analysis of the steel.

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Fine and Specialty Wire of all types including Manufacturer's Wire (Basic, Spheroidized, Annealed, Tempered, Bright and Liquor Finish, Low and High Carbon)—Welded Wire Fabric—Chain Link Fence.

CF&I Claymont, Delaware
Flanged and Dished Heads—Carbon and Alloy Steel Plates—Stainless-Clad Plates—Nickel Lectro-Clad Plates—Manhole Fittings and Covers—Large Diameter Welded Steel Pipe—Flame Cut Steel Plate Shapes.

CF&I Clinton, Mass.
Poultry Netting—Hex Mesh Nettings—Hardware Cloth—Industrial Wire Cloth—Alloy Processing Belts—Perforated Metals—Overhead Conveying Equipment—Sliding Door (Industrial) Hardware.

CF&I Mt. Wolf, Pennsylvania
Insect Wire Screening and Industrial Wire Cloth.

CF&I Oakland, Calif.
Fish and Crab Trap Netting—Stucco Netting—Poultry Netting—Hardware Cloth—Industrial Wire Cloth—Straightened and Cut Wire—Reinforcing Tie Wire—Mechanic's Wire—Chain Link Fence—Crimped Wire.

CF&I Palmer, Mass.
Wire Rope—Wire Rope Slings—Wire Clothesline—TV Guy Wire—Aircraft Control Cable.

CF&I Pueblo, Colo.
Bar, Rod and Structural Products—Grader Blades and Cutting Edges—Rails and Accessories—Chain Link Fence—Woven Wire Fence—Fence Stays—Fence Posts—Corn Cribs—Welded Wire Fabric—Nettings—Grinding Balls and Rods—Screen and Grizzly Bars—Rock Bolts—Wire Strand—Clothesline—Barbed Wire—Manufacturer's Wire (Basic, Chain, Spring, Stapling, Weaving, Welding)—Merchant Wire (Annealed and Galvanized)—Nails—Bolts—Nuts—Spikes—Seamless Casing and Tubing.

CF&I Roebling, N. J.
High Carbon Steel Wire (Hard Drawn, Spheroidized and Tempered)—Rope Wire—Tire Bead—Hose Wire—ACSR Core Wire—High Carbon Spring Steel Wire (All grades, tempers and finishes)—Regular, Sash Balance and Flapper Valve Wire.

CF&I Roebling (Trenton), N. J.
High and Low Carbon Flat Wire (All tempers, edges and finishes)—Brush, Corset, Casing, Heddle and Drop Wire, Umbrella Wire and Tape Lines—Wire Rope—Strand, Aircord and Fittings—Wire Rope Slings—Electrical Wire and Cable and Magnet Wire.

CF&I So. San Francisco, Calif.
Galvanized and Annealed Merchant Wire—Galvanized and Annealed Stone Wire—Bale Ties—Baling Wire—High and Low Carbon Wire—Galvanized and Annealed Wire—Copper Coated Wire—Rope Wire—Welding Wire.

CF&I Worcester, Mass.
Valve and Clutch Springs—Starter Springs—Tire Chain Adjusters—Cross Chain Repair Links—Mechanic's Wire—Compression, Extension and Torsion Springs of all types—Formed Wires.

3489

The Automation Program

By EDMUND B. ILYUS, P.E.
Consulting Engineer

Another P&Q Exclusive

WHEN top management has made the decision to proceed with either full or partial automation, the type of organization and working arrangements must be fully considered and acted upon in such a way as to be in the best interests of the company and employees alike. The program must be such that it will result in the most practical and economical system incorporating the best and latest automation know-how available.

METHODS

There are numerous methods of approaching the problem. However, the most frequently encountered are: (1) appointing an executive committee; (2) employing an executive co-ordinator—an automation engineer; (3) organizing an automation engineering department; (4) utilizing the services of manufacturers or suppliers; and (5) commissioning an automation consulting engineering firm.

Executive Committee The first method which most logically would present itself would be the formation of an executive committee to study the problems involved. While this may be an ideal method in some instances, usually such a committee participation means added responsibilities, and those appointed are not qualified to deal with the complexities and ramifications of automation. In many cases this can contribute to the downfall of the functioning of such a committee. Every-day departmental interests, lack of time to devote to added responsibilities, unfamiliarity with the far-reaching scope of automation, and the usual delays in action by such a committee may hamper its progress or even make it inoperative.

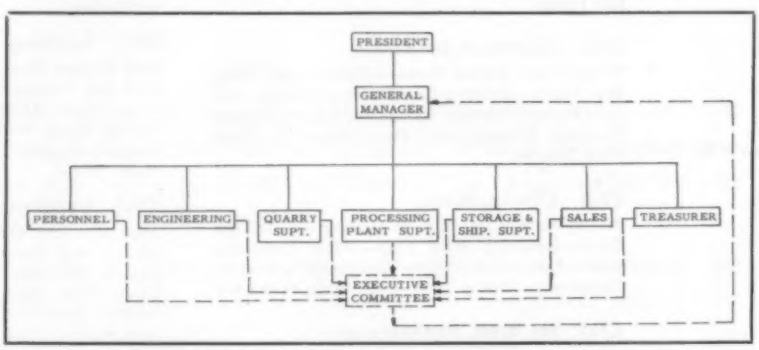
If the executive committee method is decided upon, probably the most important feature is adequate leadership. While this may pose no difficulty in a large organization, in the average business it is doubtful whether any one executive who has had sufficient experience in automation to provide the necessary leadership can be found. Since the committee members have other responsibilities which take top priority, top management must lay out a definite program, specifying deadlines for rendering recommendations; otherwise, it is doubtful that any progress could be made.

Executive Co-ordinator The second method of organizing for automation is to appoint an executive co-ordinator. This plan may have the advantage of economy, simplicity, and speed, as well as the elimination of the time-consuming responsibility of other executives and engineering personnel. This assignment should be a full-time responsibility, and as the name implies, it should co-ordinate the automation plans and serve as an information clearing house for all departments concerned. In formulating the plans, information as well as co-operation would be obtained from outsiders.

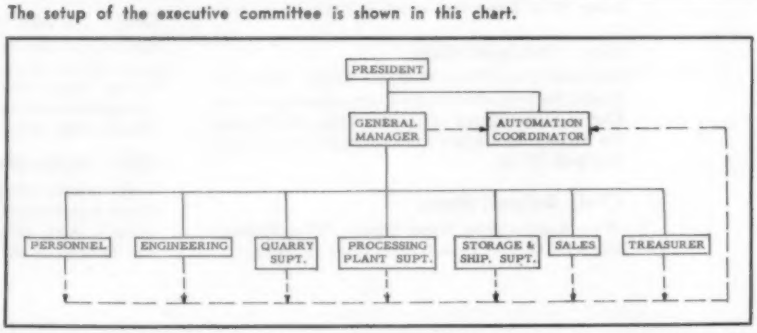
Here again there are several problems. First, there is the difficulty of finding some one within the organization who has the training to qualify him for the responsibilities. Second, if some one is to be brought in from the outside, it is difficult to find a qualified automation engineer who is familiar with the field of endeavor. Third, if a company man is appointed to the position, there is always the problem of attitudes, points of view, and general relationship with others within the organization.

Since an objective point of view is the prime reason for the appointment of a co-ordinator, it is recommended that an automation expert be employed from the outside on a permanent basis. This plan would have the advantage of freedom from preconceived ideas, personal or departmental. However, such a co-ordinator should be given an executive rating, with authority to carry out his assignments. In such a case, this method should be given due consideration.

Engineering Department In the larger organizations the existing engineering department could be expanded to include specialists experienced in the necessary fields of engineering, i. e., pneumatics, electronics, hydraulics, proc-



The setup of the executive committee is shown in this chart.



Here is shown the relation of an executive co-ordinator (automation engineer) to the company personnel.

essing, materials handling, plant design and layout, and development of automation systems. In those firms which do not have engineering departments, with the requirements of automation, the formation of such a department could be made feasible.

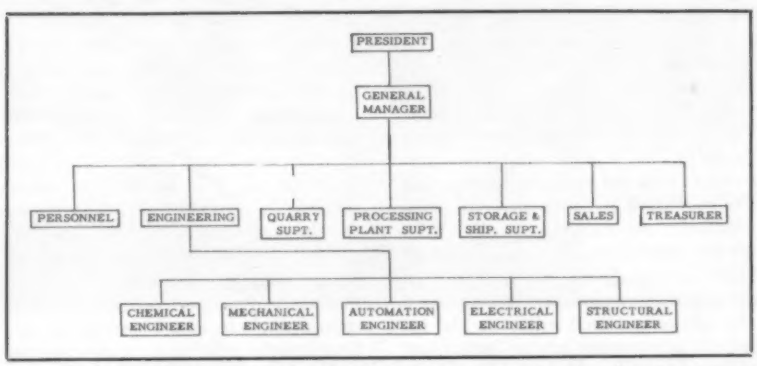
However, the engineering personnel is not all that is required in such a department. Engineers experienced in business and methods are required to interpret and carry out the interests of the finance, the personnel, the production control, and the sales departments. While this may be the best method from the technical point of view, it is doubtful that many organizations could economically obtain and maintain such a department.

Suppliers' Services From personal observations, the fourth means appears to be the most popular—the utilization of services and advice from manufacturers or suppliers. They can and do offer excellent services within the limitations of their products. They know their products from detailed assemblies and performance. But it must be remembered that their first interest is in promoting their products and making a sale. It is therefore quite understandable that the information obtained from them in relation to an overall automation program involving equipment and materials of many types is strongly in their favor, with little interest in other components involved.

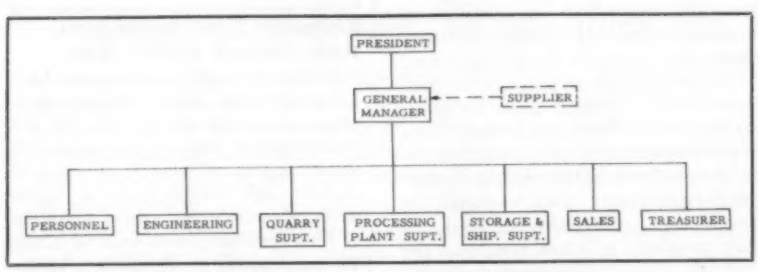
Most of the reputable manufacturers refuse to give professional engineering advice or assistance in planning a complete automation program since they have neither the time nor the staff available. However, after the program is completely worked out and the various components selected, then the suppliers are ready, willing, and able to give expert advice as to the functioning of those components which they are able to supply. Companies contemplating automation, therefore, should not and can not expect the suppliers to provide the expert engineering planning and design beyond the field of their products.

Consulting Automation Engineers The fifth suggested method of organizing for automation is by retaining consulting engineers who specialize in automation systems and procedures. Because of their experience and know-how they are in an excellent position to render valuable services to those firms needing assistance in planning ahead. Their specialized professional talents and services will pay for themselves many times over through the use of tested procedures which save time and money. Therefore, while the fee they require may seem a disadvantage at first consideration, the client is the one who benefits, since it is his interest that is being protected and not the outside supplier's.

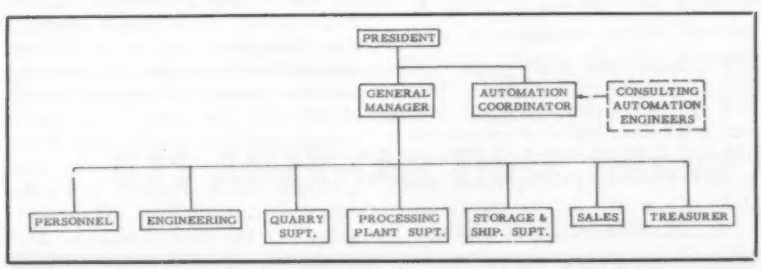
However, in selecting the consulting engineering firm, certain requirements must be met. The firm selected must have a staff of specialists in each of the various fields of automation, so that quick and efficient planning of the automation program can be realized. Such firms have the know-how in conducting automation appraisals so that the proper program can be fitted to the individual needs. To organize such an engineering firm is a complicated and expensive endeavor. In addition to the staff requirements, it is necessary to organize and maintain a reference library covering all phases of engineering and automation. It is for this reason that manufacturers do not find it feasible to set up an internal automation engineering department. Their business is manufacturing and sales, and consulting engineering is neither profitable nor feasible.



This chart presents the organization plan of an automation engineering department.



How the services of manufacturers or suppliers are utilized.



A suggested plan for employing the services of consulting automation engineers.

GENERAL SUGGESTIONS

It is difficult to make one recommendation as to the best way to set up an automation program which will fit all companies. The type of program must be organized to suit the individual conditions and preferences of the company. But because of the effects on all components of the company, all policies and programs should be under the immediate supervision of top management. Otherwise the results will be slow progress, friction, misunderstandings,

confusion, and loss of time and money.

Most consulting engineering firms will agree that the most feasible first step in setting up an automation program is to appoint an automation co-ordinator with the title of vice-president. The appointee should report directly to the president and not through any departmental head. In this way he can act as a clearing house for the co-ordination of information for the various departments in relation to the automation program.

This method has an additional advantage of obtaining and developing a leader within the organization. All businesses are endeavoring to find and develop additional executive timber. With growing needs for automation, the need for executive growth and improvement is more imperative than ever before.

Once the automation executive is chosen and the department is organized, the procedure to be followed depends largely on the availability of specialists within the organization. These specialists are trained not only in the engineering sense but also in business and economics.

To establish an automation program, the first step is to make an appraisal of all production phases to determine which are ready for automation. The results may show that the entire operation could be automated, that only certain manufacturing or office departments could benefit, and in very rare cases it may be found that due to the peculiarities of the type of business, automation could not be feasibly utilized.

After and only after a complete technical and economic study has been made, can an overall program be determined. Once the program is set up, it should be carried out in full. This requires the working out of the details on the drawing board, determining the availability of standard equipment suitable for the required functions, possibly the design and development of special equipment, and the training of personnel to think in terms of and in the use of automation.

In carrying out the program, the average company may find it necessary to supplement the executive co-ordinator by retaining the services of an experienced consulting engineering firm specializing in automation. Such a procedure has many advantages. Available are specialists who are a source of required talents and experience. Through this experience gained from solving similar problems, established procedures for conducting appraisals and designs save time and money in realizing the establishment of automation.

Utilizing a consulting firm may eliminate the usual procedure of trying various methods, only to find that they will not work in the particular application. In the long run the automation program is established with the minimum loss of time and energy and with considerable savings to the company.

Probably the most important advantage a consulting engineer can offer the automation executive is the unbiased and impartial advice. Since automation covers such a wide field within the company, such advice is particularly advantageous in aligning the various departments affected. Automation is so far reaching and the potentials so great that decisions to be made far outweigh those of individual problems.

When it is determined, for example, that a standard piece of equipment will meet the requirements of a certain element of automation, a survey of the market must be made to study the various competitive items. The selection of the equipment then becomes a major problem. It is here that the consultant is of the greatest benefit. He has no reason to favor any one manufacturer, for according to the ethics of the profession, he cannot financially benefit from the selection of one piece of equipment over another. His advice is based solely on the inherent advantages of the individual piece of equipment and how it will fit in with the other components so that the result will be a balanced automation system, offering the most profitable results to the organization.

In establishing an automation program, much thought must be given to the future. While competition does have considerable effect on the decisions, individual thinking and planning is necessary. Just to equal the production and quality of competitive products will not result in the full advantages of automation. Sights should be set high, and the courage to think and act big must be developed. Often management is so occupied with the present problems that it has no time to look ahead and anticipate the trends of markets and technological developments. The trained consultant must be constantly alert to developments and their effects now and in the future.

As an example, one producer, when it became evident that the aglime subsidy of the government was to be withdrawn, immediately developed a new product and market, so that the equipment with which he had produced aglime could still be utilized. He is producing more of the new products with his old equipment than ever before, while the same equipment in a plant near by is standing idle most of the time.

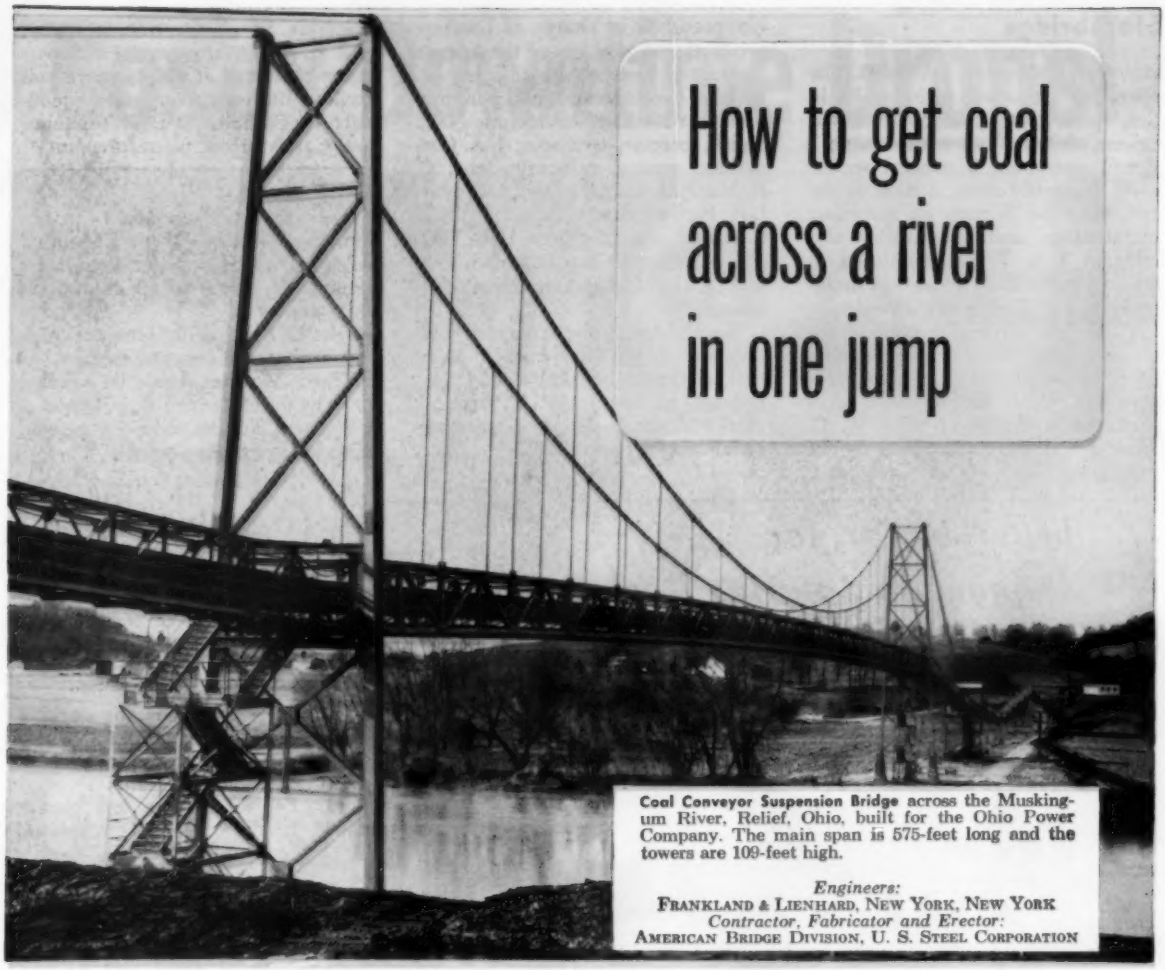
While definite predictions of trends cannot be made, trends are indicative, and plans for the future based on present accomplishments do indicate what technological developments may be expected. According to past experience, it is felt that the best approach to automation is first to establish an automation executive co-ordinator, supplemented by a consulting engineering firm specializing in all phases of automation, and second, to take immediate steps to have automation specialists study comprehensively and evaluate the product, methods of production, personnel, distribution, sales, and all factors relating to the automation program, no matter how remote.

After the study a complete report should be made to management giving in detail the findings and recommendations. In this way only can management understand the problems involved and make the proper decisions. If it is found that automation is feasible, the program should be set up with a time schedule for the completion of each phase of the program, whether for full or partial automation. The program should include check points to determine the efficiency of the system and to measure the economic accomplishments.

Kentucky Light Aggregates Adds Second Rotary Kiln

Kentucky Light Aggregates, Inc., Louisville, Ky., recently began operating a second rotary kiln for the production of Kenlite, an expanded-shale aggregate which is used in making lightweight concrete blocks and lightweight structural concrete.

The Kenlite plant, located about 16 miles south of downtown Louisville and about 10 miles north of Ft. Knox, began operations about 2½ years ago. It is of steel construction throughout and is an efficient and well laid-out plant, representing an investment of approximately $1,000,000. The plant is a wholly owned subsidiary of the Ohio River Sand Company, Inc., an old time sand and gravel producer, and is designed to operate four kilns eventually. The two present kilns are now producing aggregate at a rate of 320 cu. yd. every 24 hours.



Coal Conveyor Suspension Bridge across the Muskingum River, Relief, Ohio, built for the Ohio Power Company. The main span is 575-feet long and the towers are 109-feet high.

Engineers:
FRANKLAND & LIENHARD, NEW YORK, NEW YORK
Contractor, Fabricator and Erector:
AMERICAN BRIDGE DIVISION, U. S. STEEL CORPORATION

Conveyor Suspension Bridge, built with Tiger Brand Prestressed Bridge Strand, does the trick.

Moving coal across a river is costly—especially if you have to handle it two or three times. The Ohio Power Company solved this problem with a coal conveyor suspension bridge. Coal now flows across the river, economically, in a steady stream. There's no extra handling.

The bridge is suspended from two main cables, each composed of four 2" diameter Tiger Brand prestressed, galvanized strands. There are 44 vertical suspenders of 7/8" prestressed, galvanized bridge rope.

Prestressing the strands to one-half their designed breaking strength for several hours is a thorough test of quality of the material. It also produces a cable strand that will not stretch over the years due to use.

American Steel and Wire Division has the engineering experience and complete manufacturing facilities to produce the finest bridge strand and wire rope you can buy. Call or write for further information or contact our nearest distributor.

AMERICAN STEEL & WIRE DIVISION, UNITED STATES STEEL, GENERAL OFFICES: CLEVELAND, OHIO
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UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS AMERICAN TIGER BRAND WIRE ROPE

Excellay Preformed

UNITED STATES STEEL

Stockbridge

(*From page* 88)

visory, and laboratory personnel. The operating personnel includes 15 in the quarrying division, such as drivers, drillers, and service men; 3 shovel operators; 3 general service men; 2 powder men; 3 men at the crushers, and 1 man on screening maintenance and checkup. It also includes 4 or 5 men employed in loading operations, 3 more in maintenance, and 2 office employees.

C. E. Ireland is chairman of the board of directors of Birmingham Slag Company, and C. W. Ireland is president. C. A. Barinowski is vice-president in charge of sales, W. C. Ireland is vice-president in charge of operations, and W. R. Ireland is vice-president in charge of concrete products and president of the Atlanta Aggregates Company.

Other executive or supervisory personnel at Birmingham include N. L. Smith, secretary-treasurer; J. A. Carnathan, general superintendent; C. E. Mitchell, assistant superintendent; J. H. Pigford, chief engineer; William E. Hinkle, plant engineer; L. L. Warren, superintendent of maintenance; and J. H. Carnathan, chief electrician.

Stockbridge Stone Company officials include the following: W. Lambert, chairman of the board; C. W. Ireland, president; W. C. Ireland, vice-president in charge of operations (Alabama); John Lambert, vice-president in charge of operations (Georgia); D. E. Overton, secretary; and N. L. Smith, treasurer. Supervisory personnel at Calera operations include Buster Parker, superintendent; F. C. Snow, quarry foreman; and Carl Morrow, plant foreman.

Explosives

(*From page* 91)

a misfire too soon. Follow recognized rules and regulations, or if no rules or regulations are in effect, wait *at least one hour.*

64. DON'T drill, bore, or pick out a charge of explosives that has misfired. Missfires should be handled only by or under the direction of a competent and experienced person.

Explosives disposal . . .

65. DON'T abandon any explosives.

66. DO dispose of or destroy explosives in strict accordance with approved methods. Consult the manufacturer or follow the Institute of Makers of Explosives pamphlet on destroying explosives.

67. DON'T leave explosives, empty cartridges, boxes, liners, or other materials used in the packing of explosives lying around where children or unauthorized persons or livestock can get at them.

68. DON'T allow any wood, paper, or fiber materials employed in packing explosives to be burned in a stove, fireplace, or other confined space, or to be used for any purpose. Such materials should be destroyed by burning at an isolated location out of doors, and no person should be nearer than 100 ft. after the burning has started.

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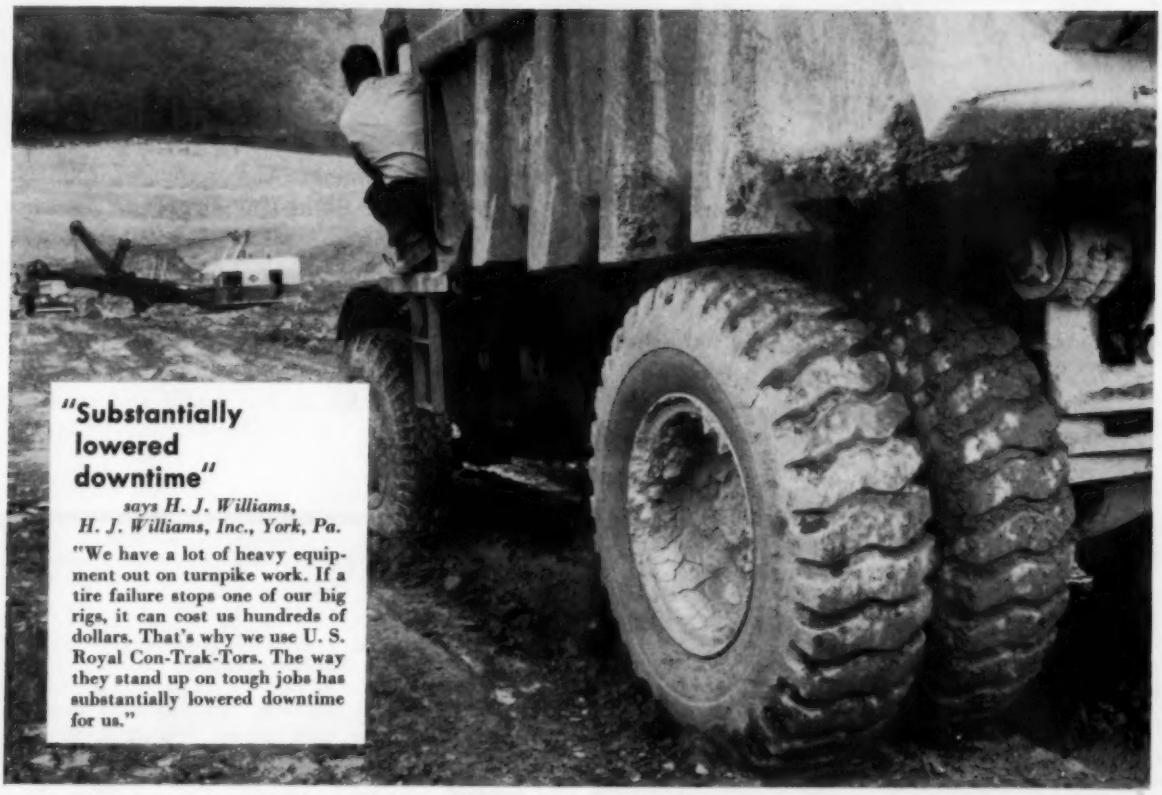
Kringel Wins Promotion On N.Y. Trap Rock Corp. Staff

John R. Kringel has been appointed assistant vice-president of the New York Trap Rock Corporation, according to Wilson P. Foss, III, president.

Mr. Kringel has been with Trap Rock for two years—one year as superintendent of the Haverstraw plant and one year as assistant to Floyd J. Buffington, vice-president in charge of operations. His new post as assistant vice-president is in recognition of his outstanding service to the company. His responsibilities are in field operations, and he will continue to work closely with Floyd Buffington, vice-president in charge of operations.

Mr. Kringel is a 20-year veteran in the construction and quarrying industry, both in this country and abroad. He had a three-year construction assignment in Australia prior to coming with Trap Rock.

Costly Downtime Drops!


"Substantially lowered downtime"
says H. J. Williams, H. J. Williams, Inc., York, Pa.
"We have a lot of heavy equipment out on turnpike work. If a tire failure stops one of our big rigs, it can cost us hundreds of dollars. That's why we use U. S. Royal Con-Trak-Tors. The way they stand up on tough jobs has substantially lowered downtime for us."

Approach to south portal of T. J. Evans Tunnel, on the Pennsylvania Turnpike near Allentown.

U.S. ROYAL NYLON CON-TRAK-TOR FULL LUG

If, like Mr. Williams, you use heavy-duty trucks, you can reduce your equipment downtime and your operating cost with the U. S. Royal Con-Trak-Tor. Here is why.

This tire's *Nylon cord carcass* stands up to vicious shocks, fights off sharp rocks and snags. It has *triple impact protection*—extra cushioning rubber between plies, double shockpads under the tread, extra-tough construction at the crown. Its *full-lug traction* pulls right through toughest going, reduces sideslip to an absolute minimum, just won't bog down.

Your U. S. Royal Dealer now has the U. S. Royal Con-Trak-Tor in your size. Have him put it on your wheels—and prove to yourself why men like H. J. Williams report that both downtime rates and operating costs *drop* with this great tire!

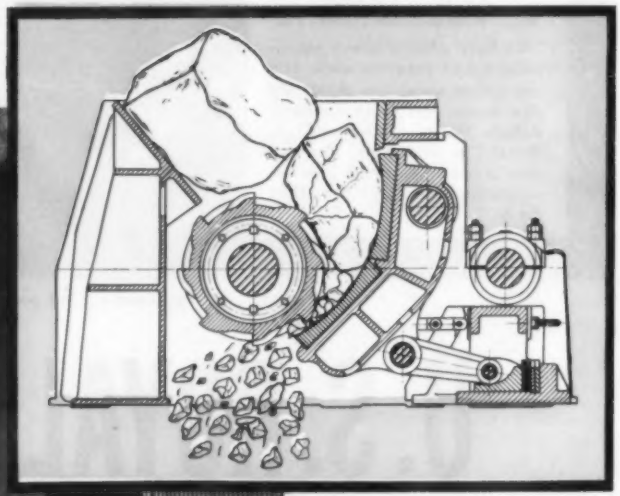
US RUBBER United States Rubber

When a Single Roll fits the job make it a

PENNSYLVANIA

If you think large single rolls have limitations on capacity and ratio of reduction you can probably stretch these if you'll use the Pennsylvania. It'll easily handle wet or frozen materials that plug jaws, gyratories and conventional hammermills, and requires much less head room. For instance, a 30″ x 60″ Pennsylvania Penn-Lehigh takes only half the head room needed for a gyratory of equal capacity. And there are certain exclusive features in the compact heavy duty Pennsylvania. There's the adjustable breaker plate with reversible and interchangeable wear liners; the roll shell is all in one piece—no segments with frozen bolts or renewable teeth to work loose. Some of these single rolls have been in use over 30 years and are still going strong, with a cost per ton that is negligible. Remember, there's only one Penn-Lehigh Single Roll and Pennsylvania makes it. Ask us for details and crushing counsel.

PENNSYLVANIA CRUSHER DIVISION
Bath Iron Works Corporation
West Chester, Penna.



PENNSYLVANIA
SINGLE ROLL CRUSHERS

PE-214

More Information, Please

Use the prepaid postcard to get this literature or additional details about new equipment and products reported elsewhere in this issue.

"THE NEW L.A. LINE" of Electric Motors is the title of an informative bulletin just published by the *Louis Allis Company*. This brochure includes photos and information on the new open drip-proof, and the explosion proof electric motors manufactured by Louis Allis. **(1)**

A 24-PAGE DIRECTORY, "This is A-C from A to Z" has been released by the *Allis-Chalmers Manufacturing Company*. The directory contains a brief history of Allis-Chalmers, with a list of the firm's 17 plant locations, sales offices and tractor branch houses. **(2)**

"ELECTRICAL REVIEW" is another publication released by *Allis-Chalmers* which describes complete line of electrical equipment. This 32-page booklet is the fourth quarter edition. **(3)**

RAPID REVERSING MOTORS, the subject of a recent bulletin published by the *Louis Allis Company*, contains information on that company's line of electric motors, drive and generators. Featured is a blower-cooled, rapid-reversing motor capable of more than 200 idle reversals per minute. **(4)**

POWER TRANSMISSIONS, manufactured by the *Allison Division of the General Motors Corporation*, have been employed in 15 models of the Chevrolet two-ton highway trucks, combining in one package a torque converter type, full power shifting, fully automatic, heavy transmission with six forward speeds and one reverse. **(5)**

KINAMATIC MOTORS AND GENERATORS, products of *General Electric*, are discussed in a new bulletin published by GE. Applications, ratings and frames are included on these drip proof design electrical motors. **(6)**

PORTABLE RECORDERS are described and illustrated six-page bulletin published by the *Bristol Company*. Samples of typical records made by thermo-humidgraphs are shown and fully described in editorial matter. **(7)**

FARREL SPEED REDUCERS, manufactured by *Farrel-Birmingham Company, Inc.*, are the subject of the firm's latest bulletin which contains full information about the line which have been re-engineered, rerated and expanded. **(8)**

FLUORESCENT FLOODLIGHTS for indoor and outdoor use in all kinds of weather are fully described in a new bulletin from the *B. P. Elkin Company*. These lights feature 400-watt flood usage, they use 90-watts of power and are waterproof. **(9)**

AUTOMATIC WEIGHERS for bulk materials are the subject of the *Richardson Scale Company's* most recent bulletin, Class 38. Class 38 heavy duty scales are designed for handling dry, ground, granular, dusty and non free-flowing materials. **(10)**

SIX-WHEEL TRUCKS, manufactured by the *International Harvester Company*, are discussed in a 24-page catalog recently made available. Present design and operating features of the S-Line, R-Line, and CO models, powered by gasoline, diesel or LPG engines, are completely illustrated. **(11)**

ADMIRO H.T. ALLOY STEEL, produced by the *Admiral Alloy Steel Corporation*, is described in a four-page bulletin which illustrates the general purposes and applications of high tensile steel, and its resistance against abrasion and shock while having great workability. **(12)**

HEAVY DUTY WET PUMPS, a product of *Yeomans Brothers Company*, are the subject of a 16-page catalog which contains the applications for uses in draining, effluent boiler blow-off, hot wells, acids and alkalis. **(13)**

HIGH-SPEED VIBRATING SCREENS, 30 to 80 percent faster than previous mechanical screens, have been placed in production by *Hewitt-Robbins, Inc.* This new screen, rated at 2,400 RPM on a 1/16-in. stroke and 3,300 RPM at a 1/32-in. setting, is designed for use with screen cloth of 10 to 80 openings per lineal inch, and may be used with dry or wet materials with provisions made for heated screen clothes. **(14)**

MODEL CR-35, a self-propelled power crane and excavator, is described in a bulletin published by the *Schield Bantam Company*. Special feature of this six-ton capacity crane is the interchangeable crane, clamshell, dragline, magnet crane,

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pile driver grapple, back hoe shovel, and backfiller. (15)

ROTARY DRYERS, featuring a self-contained pilot plant, and available in three models, have been introduced by *Hardinge Company, Inc.* A six-page booklet fully describes these pilot plant dryers which require only fuel and electrical connections to be placed in operation upon delivery. (16)

INTERCHANGEABLE IDLERS, called Series S, are the most recent development of the *Atlas Conveyor Company.* These idlers are interchangeable with most makes of idlers furnished with 4- or 5-in. diameter rolls in 18-, 24-, 36-, 42-, and 48-in. belt widths. Nine types can be furnished for general and heavy duty service. (17)

SCREW CONVEYORS, bucket elevators, storage bins and aggregate bucket elevators for batching plants are the subject of a four-page bulletin published by the *Atlas Conveyor Company.* This equipment is described as efficient, durable and economical. Specifications are included in the bulletin matter. (18)

MINING TOOLS, such as chain cutter bits, roof bits, finger bits, auger drill bits, rotary drill bits, percussion bits, and blanks for percussion bits, all products of the *Vascoloy-Ramet Corporation,* are the subject of a catalog recently made available. Size, guage and catalog number are listed for easy ordering. (19)

HYDRAULIC TRUCK LOADERS, a 3,000-lb. capacity loading implement which loads one truck or more, and a product of *LoDal, Inc.,* are the subject of a brochure released recently. The Lodal truck self-loader makes each truck a unit within itself, eliminating manpower and equipment costs. (20)

PORTABLE AND UNIT MILLS, manufactured by the *Denver Equipment Company,* are presented in a 16-page bulletin, "Denver Portable and Unit Mills." This bulletin contains photographs, diagrams and specifications of the many mills in the Denver Line. (21)

30-IN. BALL MILLS, for small tonnage-grinding, are described in a four-page bulletin, published by the *Denver Equipment Company.* These 30- by 18-in. mills are reported to provide greater profit in small plants, in regrinding, in pilot mills and portable mills. (22)

SAFETY HOOKS, a product of the *E. D. Bullard Company,* are the subject of a catalog which contains photographs of hooks and connectors for types A through S in the Bullard line. Specifications and ratings also are contained in this complete catalog. (23)

SERIES 50 IDLERS, for *Link-Belt Company* conveyors, are fully discussed in a new brochure published by that firm. Series 50 idlers are available in two types, greaseable and factory sealed, for seven belt widths ranging from 14- to 36-in. (24)

TESTING SCREENS, for the size control of construction aggregates, are the most recent product of the *Gibson Company.* These screens automatically make as many as seven separations at once, in a size range of 4-in. to 200-mesh, for routine test sizing. A fine screen attachment for 8-in. sizes sieves is available. (25)

RAILAID, a self-propelled, heavy-duty crane manufactured by the *Koehring Company,* is presented in an eight-page bulletin recently released. The 205 Rail-Aid works on or off track with a rail speed of 20 m.p.h. and can be used as a shovel, dragline or clamshell crane, a lift crane, or as a hoe, with appropriate attachments. (26)

SCRAPERS, products of the *M-R-S Manufacturing Company,* are introduced in a brochure which illustrates and editorializes its many uses. Available in five models, the scrapers are powered by 210- to 500-h.p. motors with 8.4 to 34-cu. yd. capacities. (27)

CONVEYORS, a product of the *Barber-Greene Company,* are the subject of a new catalog. Long or short standardized conveyors which allow faster delivery, and quicker and easier erection are described and listed in this 192-page edition with 85 job photographs and 16 plant layouts. (28)

IN-LINE HELICAL GEAR DRIVES, manufactured by the *Link-Belt Company,* are described in a 16-page brochure with photographs, cut-aways, drawings and specification matter. (29)

MARCH, 1956

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He's laying the main (trunk) line of Primacord to connect all holes in a hook-up which will permit relief of burden — develop better fragmentation with less secondary blasting. Holes have been loaded and tamped. A "down" line of Primacord extends from top to bottom of each hole, in contact with all explosives in the load, detonating directly or initiating a primer — depending upon the type of explosive used.

When the trunk line has been laid, he'll cut it from the spool — then connect each "down" line at right angles to the trunk line with the simple half-hitch which has been found most effective for the type of Primacord used in the holes.

When all is ready for the blast, he'll prepare his fuse and cap (or use an electric blasting cap) and tape this cap onto the firing end of his Primacord hook-up.

Primacord is an insensitive detonating fuse. It cannot be set off by fire, friction or ordinary shock, but must be detonated. It is not affected by stray currents, and even a direct hit by lightning failed to detonate it.

For more information
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Primacord • Quarrycord • Ignitacord® • Safety Fuse
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P-1

Sintering and Lightweight Aggregate

PART II
Some Practical Considerations in Planning a Sintered Lightweight Aggregate Manufacturing Plant

By ADOLPH F. LEITNER
President, Netcong Engineers, Inc.
Newark, N. J.

THE first lightweight aggregate manufacturing plant employing the sintering process was activated in 1949. The total number of such operations at this writing stands at 12—with a combined capacity of roughly 2,000,000 cu. yd. of product per annum.

While it may be fairly concluded that this growth has been rapid, total capacity is nevertheless a long way from matching the demand potential. The existing plants are situated in only 10 of the 48 states, and only one plant is located west of the Mississippi River.

If one were to draw a circle with a radius of 100 miles around each of the plants to represent the maximum practical market limits, the combined area theoretically capable of being served by all present plants would amount to less than 13 percent of the total land area of the United States. From a practical standpoint, this percentage is even smaller.

To those who might raise an eyebrow or two at the prospect of a lightweight aggregate plant atop Mt. McKinley or in the middle of some remote desert wastes, one need only point out that a single plant in most areas with even moderate population density could not begin to meet the potential demands of the area included in a 100-mile radius.

In view, then, of the fact that the sintered lightweight aggregate manufacturing industry has, as a whole, found the business to be a profitable one, and considering that the process can be demonstrated to possess certain inherent economic and operating advantages, the more logical point to raise would seem to be not how fast the industry has grown, but rather *why the growth has not been even more rapid.*

The best answer to this query, apart from the usual immediate considerations of any particular case, would seem to lie in the complete lack of tradition relating to the sintering process in the rock and clay products industries. This is not to imply that the members of this broad group have closed their eyes to something new—for obviously this is not so. It does suggest, though, that the essential information concerning the sintering process has been slow in reaching those within this group; and it has been even slower in reaching those outside the industries who are constantly on the alert for new business opportunities.

What are these essential considerations? In the following review some of them will be recognized as germane to the manufacture and distribution of lightweight aggregate by any other process. However, taken as a whole, they spell out the delineating basic prior considerations of the sintered lightweight aggregate manufacturing installation. They may be categorized as follows: (2) raw material, (b) potential market, (c) plant capacity, (d) fuel, and (e) product promotion.

In addition, there are, of course, the ever-present considerations of financing and of the planning and execution of the project, which are so universal in all fields that they need not be considered here. Suffice it to say, they are equally as essential as any of those here discussed.

In a previous article on this subject published in the February issue of Pit and Quarry, A. F. Leitner discussed the essentials of the sintering process. In his current article Mr. Leitner treats with some of the practical considerations in planning a commercial sintered lightweight aggregate manufacturing operation.

The Raw Material

While it has been said that anything which will fall by its own weight can be sintered—and, indeed, such things as old radio tubes, storage battery plates, and spent ammunition cartridges are regularly sintered in connection with secondary smelter operations—the demands of the end product, where it is to be high-grade lightweight aggregates, call for a somewhat more discriminating selection of the raw material.

Most clays and shales are readily sinterable and produce a good quality of aggregate. The selection of materials is probably wider here than for any other process since the bloating characteristics of a given material, for example, are not in themselves decisive. At the same time, because the mineralogy of these materials is so complex and variable the sintering characteristics of any material are probably most effectively and expeditiously established by specific observation and test.

The conditions for testing are relatively simple, and the required test equipment may be constructed at modest cost. For those who do not wish to perform the tests themselves, there are several commercial, educational, and research organizations suitably equipped with the necessary facilities and know-how. The results of these tests should provide, among other things, the sintering speed of the material and the percentage of fuel required to achieve the sintering reaction.

To justify further consideration, the sintering rate should be near or exceed the equivalent of a production rate of 1.5 cu. yd. of product per square foot of hearth area per 24-hour day. The fuel requirements should be below 10 percent by weight. There will be the usual exceptions to this general rule, as for example in the case of certain coal-bearing shales for which a slower sintering speed may be tolerated in view of the savings in fuel costs. Once

these primary considerations have been satisfied, the sintered product should be tested in accordance with the appropriate A.S.T.M. test procedures. Here again commercial testing laboratories may be employed if desired. The product should meet all required specifications for top-quality lightweight aggregates.

No attempt will be made here to go into details concerning the deposit itself. Needless to say, its location, size, ease of working, water, and drainage should all be considered—each in its proper perspective. However, two points which might save considerable time and trouble in evaluating a particular deposit should be mentioned here.

First, watch for the plastic or "fat" clays which do not drain readily upon being exposed. In addition to the mining problem, the material is difficult to process while in a plastic state.

Second, be on the lookout for lime pebbles. These could be changed into quicklime during the sintering reaction and slake upon subsequent exposure. Little harm will result if the lime is in small particles. However, the larger pebbles may be the cause of popouts in masonry made from the aggregate in which they are present. While this latter condition may be neutralized, it is better to try to avoid the problem. Parenthetically, with regard to the location of the deposit, none of the present plants hauls raw material more than two or three miles—the great majority less.

Other silica- and alumina-bearing materials can also be sintered, whether fly ash from the power-generating station or tailings or other waste materials from mineral or chemical processing plants. While the quantity of these waste materials is usually either too limited or their location is too remote, they should nevertheless not be overlooked in view of the possible savings in raw material and mining costs.

The Potential Market

Broadly considered, the market for manufactured lightweight aggregate is expanding. Aside from the effects of the generally high level of construction activity, and these are not inconsiderable, there are two significant factors contributing to the likely prospect of its further and continued growth.

In the first place the supply of coal cinders, long employed as an inexpensive though inferior grade of lightweight aggregate, is fast disappearing. Lump coal as a fuel has now been largely displaced by oil, gas, and powdered coal. Coupled with this situation is the fact that even in the case of the natural heavy aggregates, supplies in many areas are being depleted and costs continue to rise in the face of the more marginal operations and longer hauls.

Second, and particularly from the standpoint of construction costs, the established trend for some time has been to the larger masonry units. This trend, in every area where a reliable high-grade lightweight aggregate is available, has been projected far beyond the 8- by 8- by 16-in. building block. We have in addition pre-stressed lightweight concrete beams and sections, pre-cast lightweight concrete forms, lightweight concrete in monolithic applications—all with a combined potential virtually twice as large as that of the conventional building block—but at the same time completely dependent upon the ready availability of a high-grade lightweight aggregate of uniform and consistent quality. In this respect progress in the concrete construction art in the last ten years has undoubtedly been more closely tied to the advent of manufactured lightweight aggregate in staple supply than to any other single factor.

Viewing the potential market from any specific geographical point, there are many other and more immediate considerations. Population density, rate of community growth, and availability of competitive natural and by-product aggregates are probably the most important.

According to trade estimates, the *per annum* consumption of aggregates for production of blocks alone amounts to nearly .25 cu. yd. for every man, woman, and child in the country. Adding the newer product applications mentioned above, we have a total current demand potential of at least 75,000,000 cu. yd. of aggregate *per annum*—the equivalent of .4 to .5 cu. yd. per person. (Compare this with the 2,000,000 cu. yd. capacity of present sintered lightweight aggregate manufacturing plants.)

As in the case of all averages, the geographical distributions of this demand is far from uniform. A recent study made by this author of a fast growing Southeastern metropolitan area with a population of 250,000 indicated a total present consumption well in excess of 1 cu. yd. per person. It is just as certain that there are areas in which the total demand potential will be considerably less than average. In the final analysis the potential market of any given area must be determined in the light of specific realities. The local chamber of commerce and the classified section of the telephone book, together with a good highway map, will provide a satisfactory start. Railroads, universities, trade associations, and governmental agencies are all likely sources not only for information concerning the market but also for assistance in locating possible deposits and plant sites. Those already in the rock and clay products industries surveying their own locale will undoubtedly find this task considerably less formidable.

Transportation costs are a most significant factor in any marketing operation and particularly in the case of a low-cost bulk product such as lightweight aggregate. With these costs approaching $1 per cu. yd. for a 50-mile haul, it will be apparent that the general potential market area must be more particularly defined.

The effects of available natural and by-product aggregates upon the general price level in the area must also be carefully weighed. There is little question but that a high-grade manufactured lightweight aggregate will, if based upon sound economic considerations, command a price premium. The question is not so much a matter of how large this premium might be, but rather to what extent the general price level might be influenced by the mere introduction of the manufactured product. It is a complex question involving complex considerations. Ultimately it will probably be influenced as much by the amount and quality of product sales promotion as by anything else.

With due consideration to all these factors, a reasonable answer to the question of specific market potential can be developed. The hitch, if any, is more often in the amount of time and effort actually expended on this phase of the study, rather than in the availability of the necessary source information.

Plant Capacity

The successful lightweight aggregate manufacturing operation presupposes a large-volume, low-cost operation. Cost in this instance is directly related to volume, and volume eventually to capacity.

The lightweight aggregate sintering plant is composed in essence of three main functions—mining, materials handling, and conversion. The mining operation is usually reasonably flexible and capable of being expanded as required, with minor capital outlay. The materials-handling system, including the crushing and screening equipment for both

raw material preparation and product sizing, is more often than not designed to handle the expected load, with capacity to spare. The conversion operation, however, is strictly limited by the sintering rate of the material and the active hearth area of the sintering machine. Accordingly, the sintering machine is the determining capacity factor.

The sintering process is particularly well adapted to large-volume operation. A unit of conventional size, such as has been employed for many years in the metallurgical industry, has an active hearth area of 600 sq. ft. Applying this hearth area to an average material sintering at a rate equivalent to an output of 1.85 cu. yd. of product per 24-hour day, we have an actual daily output capacity for one such sintering machine of 1,110 cu. yd. of product.

While it is true that most sintered lightweight aggregate plants operating today do not have so large a capacity and it is recognized that there may be areas in which this capacity could not be justified, a machine of this capacity nevertheless enables an operator to approach the practical limits of operating economy and minimum unit cost.

On the other hand, it should not be concluded that an operation involving a smaller output will necessarily be uneconomical. Indeed, one of the most successful lightweight aggregate sintering installations has a capacity of only about 600 cu. yd. of product per day, and reached its break-even point when producing and selling just over 200 cu. yd. per day. However, considering the fact that a sintering unit may be operated intermittently, say for one or two shifts, without loss of basic efficiency, the competitive advantages of the larger unit, if it can be justified, are too significant to ignore.

Initial capital investment in a new industry is admittedly a sensitive consideration, and there are limits to which financial commitments are made. However, the experiences of the industry thus far all point to the fact that the sintered lightweight aggregate manufacturing business is a large-volume rather than small-volume business, and that the ratio of financial return to capital investment generally favors plants of larger capacity.

Fuel

Except for a minor amount of gas or oil used in the initial ignition of the material charge, the fuel required in the sintering process is, for all practical purposes, invariably of the solid carbonaceous type. This becomes a most important consideration since the solid fuel is generally the major cost item of the entire lightweight aggregate sintering plant operation.

Fortunately, the sintering process is reasonably tolerant of a great variety of solid fuels. Even charcoal has been employed in some remotely situated metallurgical operations. In this country, where our choice may be a bit more limited, they include coke breeze, anthracite and bituminous coal and coal fines, and lignite—and intermediate types.

Here again, it is a matter of adequate testing of the raw material, for materials behave somewhat differently with each type of fuel. Consequently, it resolves itself into a matter of utilizing those fuels which are most economical in the geographical area in which the plant is located. If several different fuels are available at comparable cost, it is a matter of determining which fuel propagates the sintering reaction resulting in the best product characteristics in the most economical time cycle.

Certain materials such as coal-bearing shales and fly-ash contain their own fuel—and, in theory at least, offer attractive prospects for cost savings. In practice this may be substantially so. However, assuming for the moment that all other conditions are equal, there are added considerations.

First, in the case of carbonaceous shale, there is usually an excess of fuel in the material. Under such circumstances the material will sinter at a considerably slower rate and the net recovery will be less since the entire carbon content will have been burned out.

Second, in the case of fly ash the unburned carbon remaining in the ash rarely provides the same heat values as virgin fuel. Consequently, unless the carbon content of the fly ash is unusually high, the further addition of a small percentage of fresh fuel may be necessary. It should be noted, however, that in the case of the carbonaceous shale the carbon content can be satisfactorily reduced through the introduction into the mix of some suitable carbon-free material. Furthermore, in the case of fly ash the net B.t.u. costs are extremely low, even where some fresh fuel has been added.

Since, as previously mentioned, fuel is usually the largest single cost item, it follows that its availability at a reasonable price will influence the overall economics of the proposed operation. This is particularly so because other methods of lightweight aggregate manufacturing utilize gas or oil as their prime fuels.

Conceivably, then, the inherent B.t.u. economy of the sintering process could be offset in a situation wherein the cost of the solid fuels is unusually high and that of the other fuels unusually low. Actually, this condition does not exist in many areas of the country since the cost of the gas or oil B.t.u.'s would have to be somewhat less than ½ of the cost of the equivalent B.t.u.'s of the solid fuel. Where this condition does exist, it should obviously receive appropriate consideration.

Product Promotion

It is probably safe to say that the sintered lightweight aggregate industry received its greatest impetus not so much through design as through sheer necessity. The reasonableness of this statement is attested to by the following analysis of the composite backgrounds of the builders and operators of the present lightweight aggregate sintering plants. Of the 12 operators, five were block plant operators (including also ready-mix); two were brick plant operators; one produced sand and gravel; one was engaged in miscellaneous related activities; and three were not formerly in any business related to lightweight aggregate sintering.

It will be apparent from this analysis that the aggregate *consumer* has been the primary factor in this new industry. While virtually all producers are currently marketing their aggregates to the trade, it seems most likely that their initial interest in lightweight aggregate was prompted in large measure by a first-hand appreciation of the growing shortage of suitable aggregates.

From this it may appear that all one need do is to build a plant—and behold, the clamoring customers descend upon the discharge end of the sintering machine in droves. Unfortunately, this is never so—at least one should never count on it. For despite the widespread shortages of suitable supplies and the many advantages of the manufactured aggregates, it has been the consistent experience of practically all producers that the product must nevertheless be actively promoted. These promotional efforts have in many cases been substantial.

Accordingly, in planning any lightweight aggregate operation, and particularly where there is competition with less costly aggregates, a well composed promotional program having broad educational overtones should be considered essential to the success of the venture. The primary

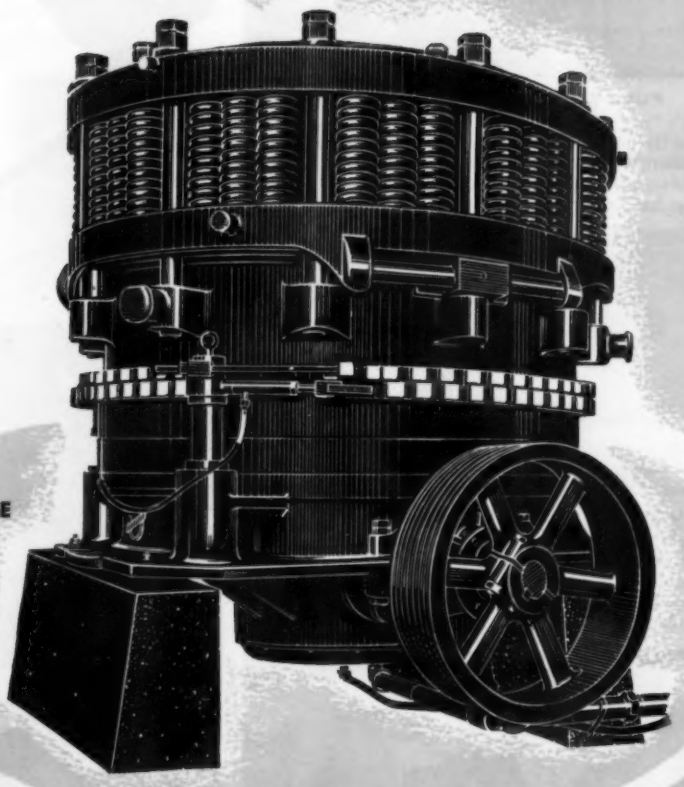
(*Continued on page* 110)

1906

TELSMITH

EQUIPMENT for AGGREGATE PLANTS

50th ANNIVERSARY



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1956

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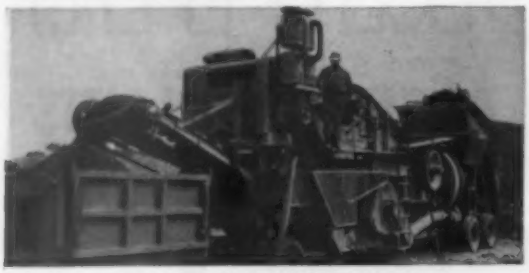
Representatives in Principal Cities in All Parts of the World • Cable Address: Songworks, Milwaukee

For Lower Costs on
SPECIFY GM
In ALL Your

PRODUCTION DOUBLED—FUEL COSTS CUT 33⅓%

When Clark & Sons Sand & Gravel Company switched to a GM 2-cycle Detroit Diesel properly engineered for this dredge, production jumped more than 200% and fuel costs dropped one third. GM Detroit Diesel weighs half as much as engine it replaced, starts easier, too.



FUEL COSTS $1.18 PER HOUR

And that's "mighty cheap" for a 300-H.P. engine according to Charles Bartelma, Superintendent of Minnesota's Kimmes Construction Company. This GM Detroit Diesel-powered Cedarapids crusher produces 4,200 tons of gravel a day—engine has had no repairs in 2½ years.

PRODUCTION UP 30%—FUEL COSTS CUT 40%

When Calumet Paving Company switched to a GM Detroit Diesel on this paver they got an engine that "starts easier, performs better, costs less for fuel and maintenance." Company also operates two other pavers and three crawlers—all GM Detroit Diesel-powered.

15 YEARS' SERVICE AND STILL GOING STRONG

The GM Detroit Diesel in this Koehring shovel went to work for Paul Frank, Inc., in 1941—is still giving "economical, trouble-free service." Owner calls engine an "excellent investment, considering low first cost, operating economy and long life between overhauls."

OPERATES 20 GM DETROIT DIESELS

Ohio road-builder A. J. Baltes, Inc., operates 20 GM Detroit Diesel engines powering shovels, cranes, draglines and other equipment. Company specifies GM Detroit Diesel power when ordering new equipment—also replaces other engines with GM Detroit Diesels to get "the fundamentals needed for economical operation—performance, economy and service availability."

Every Contract

DETROIT DIESEL POWER

Construction Equipment

YOU CAN HANDLE every construction job from first cut to final paving—and handle it at less cost—with General Motors Detroit Diesel-powered equipment.

Shovels, scrapers, compressors, graders—machinery for over 1,000 applications made by more than 150 manufacturers—are powered with GM Detroit Diesel engines, *America's first choice Diesel.*

This compact, brawny work horse costs less to buy than other Diesels of comparable horsepower.

It costs less to run because its snappy 2-cycle operation gives faster acceleration, faster digging and hauling, more work done per shift.

And it costs less to maintain, too. Parts cost less. Valves, cylinder liners cost less than similar parts for other Diesels.

For full details on GM Detroit Diesels—and the equipment they power—call in your local GM Detroit Diesel distributor or write direct.

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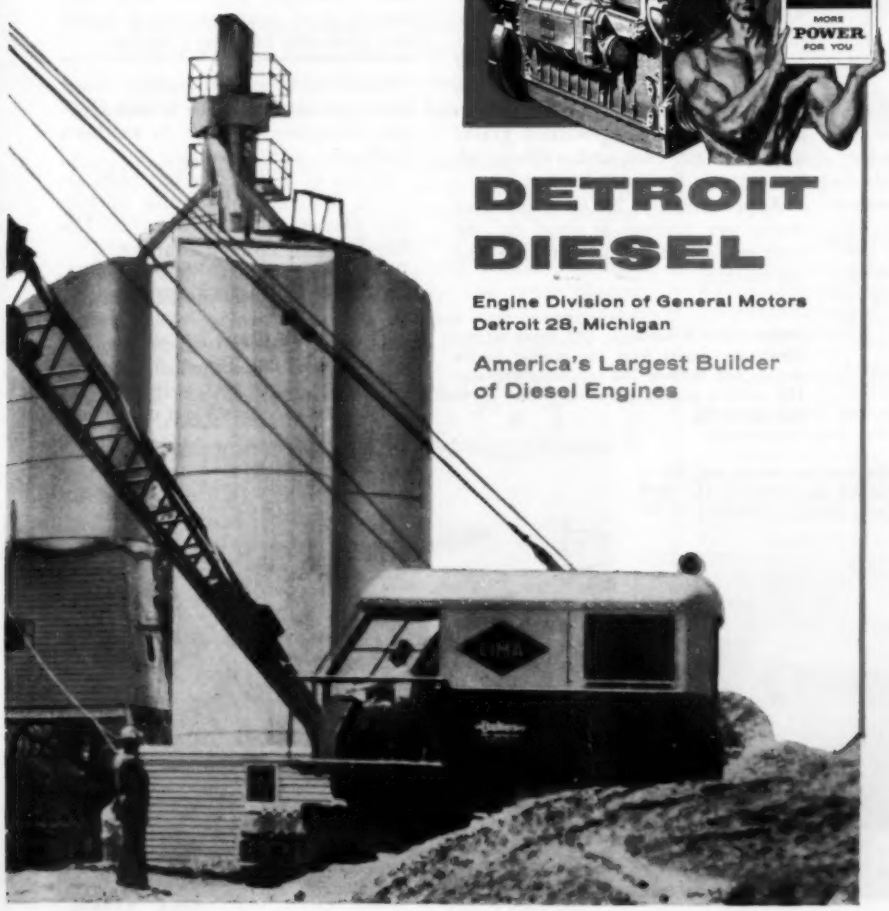

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For full details on the parts and service behind GM Detroit Diesel performance, call in your local GM Detroit Diesel distributor or dealer. He's listed in the Yellow Pages—or write direct for the name of the distributor nearest you.

Sintering

(*From page* 106)

consumer, the builder, the architect, and the appropriate departments of the local governments must all be adequately informed on the advantages and desirable characteristics of the manufactured product.

This is only the beginning. The application of modern masonry concepts and construction techniques, with respect to which high-grade lightweight aggregate is a necessity, rather than a desirable alternate, must also be actively advanced. This is the "post-graduate" phase of the educational program, in which the aggregate producer must again take the initiative. By so doing the producer will insure, insofar as it is possible, that the product will receive its fullest acceptance and that the operation will realize its maximum potential. While most of this educational data has already been widely disseminated, its impact when accompanied by the product itself will be fresh—almost as if it were being presented for the first time.

In addition to the foregoing matter and in order to complete the picture, certain other considerations of a more or less routine nature should be noted. One item is the availability of adequate electric power and labor, a matter which should pose no unusual problem.

There is also the subject of plant design, which is somewhat beyond the basic considerations with which this article is concerned. However, nothing in this area of design would alter the perspective which this article seeks to present.

In an earlier passage reference is made to the economic and operating advantages of the sintering process. These are no mere vagaries. In terms of output capacities, fuel economy and flexibility of operation the sintering process for manufacturing lightweight aggregate has no peer. In this general connection, the reader is referred to the first article of this series for a basic explanation of the process itself.

Finally, with due regard to the realities of life and the sensibilities of the operators with whom this author has had the pleasure to work, it is his considered conclusion that the manufacture of sintered lightweight aggregates offers an interesting business challenge, together with unusually good prospects for a sound and profitable business operation.

Texas Operation Achieves 4,050 T.P.D. Aggregate Output

AN ingenious arrangement of 11 conveyor belts is used by the R. E. Janes Gravel Company, Inc., at its plant near Abilene, Tex., to process 4,050 tons of sand and gravel per 18-hour day. Of this total output 75 percent goes to the Abilene Air Force Base, now under construction. Unwashed gravel from the pit three-quarters of a mile from the processing plant is loaded by a 2½-cu. yd. dragline and hauled to the plant by four 10-cu. yd. side-dump trucks.

Pit material is dumped into a hopper and grizzly, from which it travels on a 30-in. by 80-ft. conveyor to the scalping screen. Sand is washed through to two sand screws for additional cleaning. From the scalping screen the material drops onto the No. 1 shaker, where the remaining sand falls through and is carried to sand screws, by a chute. The sand is delivered to a stockpile by a 24-in. by 100-ft. belt. Minus ½-in. gravel drops out at shaker No. 2. From this point it is conveyed by an 18-in. by 66-ft. Thermoid belt to a 30-cu. yd. bin for truck loading.

All material too large for the No. 2 shaker is fed back to a crusher by an 18-in. by 112-ft. Thermoid belt. Crushed material drops onto the 30-in. belt, which takes it to the scalper and screens.

Graded gravel (1¾-in.) is taken from the No. 2 shaker by a 24-in. by 90-ft. conveyor to the 66-ft. reversible stockpile conveyor. Underground conveyors running in 8-ft. corrugated pipe take stockpiled material to the log-washer. A 24-in. by 100-ft. Thermoid belt carries log-washed gravel to the rewash unit, and a 60-cu. yd. bin is ready for truck loading.

Approximately 2,000 gallons of water per minute is used on the scalping screen, sand screens, and log-washer.

Below, right: A conveyor (A) takes pit material plus gravel from the crusher to the screens and shakers. The reversible conveyor (B) delivers graded gravel to either of the two stockpiles.

Four sales representatives have been appointed by the Kaiser Gypsum Company to serve in southern California and Arizona.

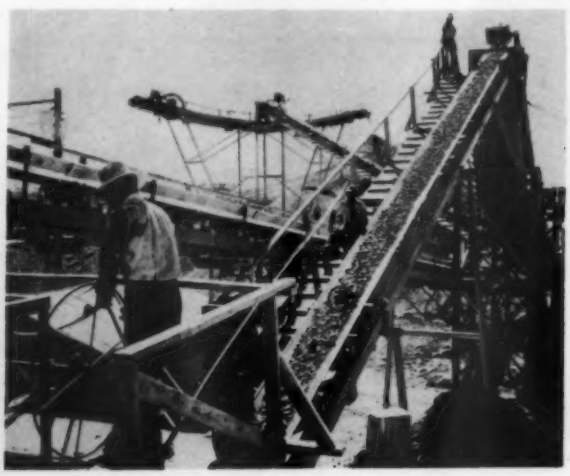
HUGH G. FERGUSON has been assigned to handle promotion of lath and plaster sales in Ventura, Los Angeles, and Orange counties.

ALLAN R. OLSON has been assigned to the Riverside-San Bernardino area.

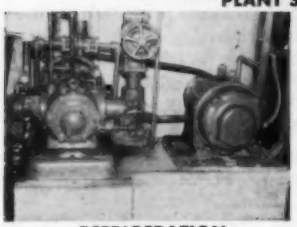
JACK L. COSBEY will be working in San Diego and Imperial Counties.

Serving in Arizona will be KURT E. STORCH, operating out of Tucson.

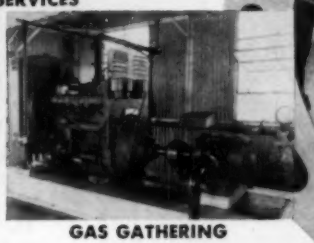
Sand screws (A) receive sand from the scalping screen and No. 1 shaker screen. Washed sand is stockpiled by conveyor (C) and loaded by dragline. Some less than ½-in. gravel is conveyed to the 30-ton bin (B).



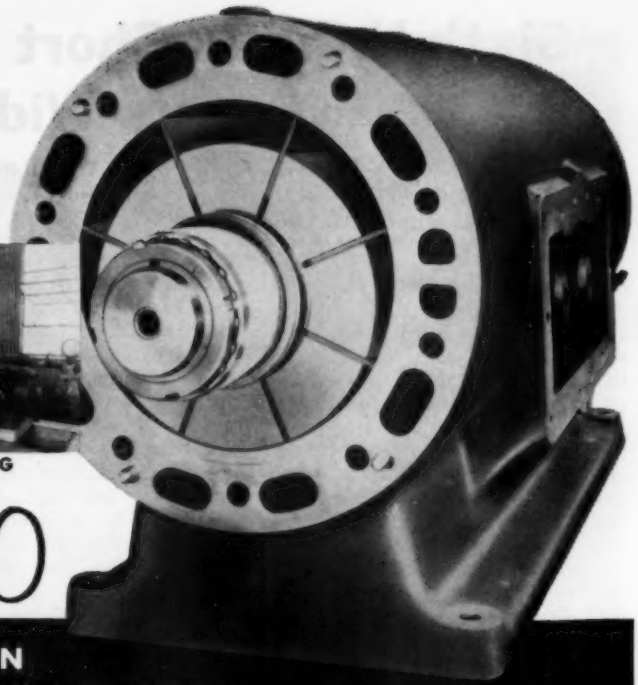
PLANT SERVICES



REFRIGERATION



GAS GATHERING



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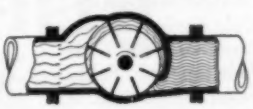

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Sixth N.C.S.A. Short Course Program Covers Wide Field

By A. T. GOLDBECK
Engineering Director
National Crushed Stone Association
Washington, D. C.

AGAIN a short course for salesmen has been completed successfully by the National Crushed Stone Association. This course of instruction is one of the many services offered to the members of the Association; and, judging by the growing attendance and the many voluntary expressions of approval, this seems to have become a service of ever increasing popularity and value.

Although in past years those attending have enjoyed the privilege of meeting in one of the beautiful assembly rooms of the U. S. Chamber of Commerce, it was thought desirable to hold this meeting at a hotel in which all of those attending could be housed instead of being dispersed in a number of different hotels. Accordingly, the Sixth Short Course was given at the Sheraton Park Hotel on December 6, 7, 8, and at the laboratory of the Association on December 9. This meeting place arrangement proved to be very satisfactory; it made for the advancement of acquaintanceships and for excellence of attendance at all of the sessions.

It might be of interest to know the reasons for giving these short courses. The production and sale of crushed stone has many ramifications, for the product has widely different characteristics from excellent to unacceptable, and it is used in many different ways. What are these various characteristics of stone, how are they determined, and why should stone be required to meet definite specifications?

There is certain background information which stone producers should have in the business of producing and selling stone, not that such information will necessarily help to produce and sell stone; but those in the business are expected to know their product. Hence, the program contained the subject of *Classification and Characteristics of Rocks Used for Construction.*

The part which aggregate characteristics play in the design of pavements, and the proper use of stone in their construction were treated in papers on pavement design; and the uses of stone in different pavement types such as surface treatments, waterbound and stabilized aggregate base course, penetration macadam, and bituminous concrete were ably presented by a group of experts.

Specifications were also discussed in papers on particle shape, reasons for the requirements in aggregate specifications, and deleterious materials in aggregates. Some very practical problems in bituminous concrete, including cracking, shoving, stripping, and the effect of high temperature on asphalt during shipment were treated; and finally, the proportioning of concrete and of bituminous concrete as practiced by N.C.S.A. was described and discussed.

Railroad ballast was discussed in a very practical way by an expert on that subject from the Association of American Railroads. Fire resistance tests on concrete were ably described by an engineer from one of our member companies.

One full day was given over to exhibits and demonstrations of laboratory equipment, methods of testing, and special research problems. It was not practicable to operate the testing machines to any extent because of the resulting noise and the crowded condition of the laboratory; but, nonetheless, it was possible to show the laboratory equipment, describe its use, and give a good idea of the wide diversity of problems which the association is called upon to solve for our member companies.

As in the past, the lectures were presented by members of the staff of the National Crushed Stone Association and by other engineers who were selected because of their wide experience in their special fields. These outside speakers were men of national and even international reputation, and the association was exceedingly fortunate in having them as speakers.

The speakers, in alphabetical order, were as follows:

Russell H. Brink, highway research engineer, Physical Research Branch, U. S. Bureau of Public Roads, Washington, D. C.

A. B. Cornthwaite, testing engineer, Commonwealth of Virginia Department of Highways, Richmond, Va.

A. T. Goldbeck, engineering director, National Crushed Stone Association, Washington, D. C.

J. E. Gray, field engineer, National Crushed Stone Association, Washington, D. C.

F. H. Jackson, principal engineer of tests (retired), U. S. Bureau of Public Roads, Washington, D. C.

E. B. Kirby, professional engineer, New York Trap Rock Corporation, New York, N. Y.

Charles F. Parker, chief engineer, W. H. Hinman, Inc., Gorham, Maine.

H. M. Rex, highway physical research engineer, Physical Research Branch, U. S. Bureau of Public Roads, Washington, D. C.

J. M. Rice, research and testing engineer, National Crushed Stone Association, Washington, D. C.

Rockwell Smith, research engineer, roadway, Engineering Division, Association of American Railroads, Chicago, Ill.

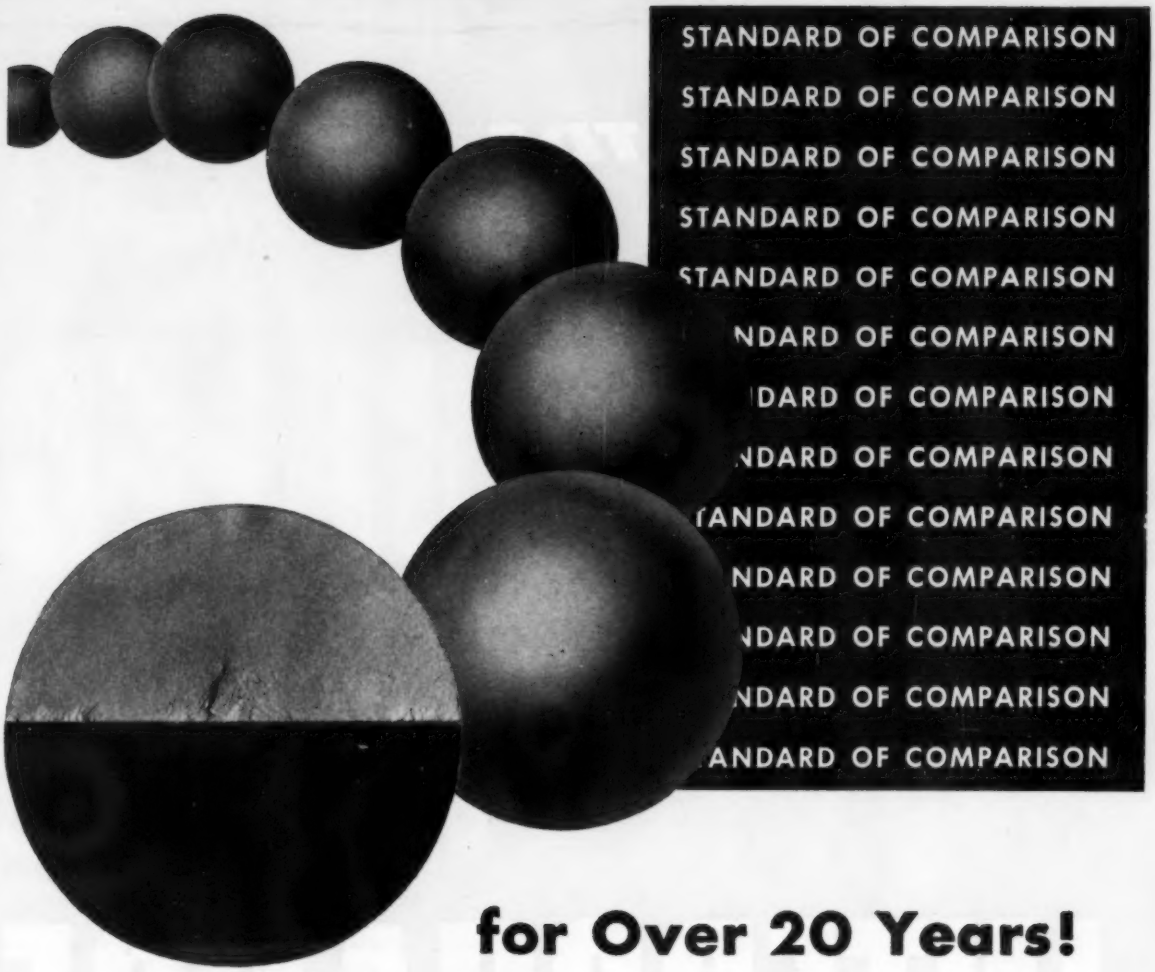
J. E. Wood, materials engineer, Maryland State Roads Commission, Baltimore, Md.

On the evening of the first day's session a get-together party, evidently was attended by everyone, was held at the Sheraton Park Hotel. This is a sure way of getting acquainted and is a popular feature of the Short Course.

The registration list showed 119 representatives from 42 companies, 11 speakers, and 28 guests, a total of 156.

The attendance was sustained at all of the sessions; and the discussion which followed the papers and the attention paid to the speakers demonstrated great interest on the part of the audience. There is no question that this Short Course activity is a very popular one which should be repeated at frequent intervals in the future.

An announcement has been released by the James F. Lincoln Arc Welding Foundation giving details of its $20,000 competition "for ideas to accelerate progress in arc welding". First award will be in the amount of $5,000, the second $4,000, the third $3,000, the fourth $2,000, and the fifth $1,000. There will also be 15 smaller awards. Entries are now being received; closing date of the competition is July 30, 1956. Communications should be addressed to the foundation at Cleveland, Ohio, P.O. Box 3035.



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Longer service, simpler maintenance! Most wearing parts used in this new tandem are identical to parts in widely used Timken-Detroit® standard single axles. This use of standard gears, pinions, differentials, bearings and brakes means more time on the road for operators . . . reduces parts inventories . . . and speeds service.

7500 extra ton-miles of payload a year! This new TDA tandem is over two hundred pounds lighter than any other unit of the same capacity. During an average 75,000 mile year, an operator can save 7500 deadweight ton-miles. This deadweight can be replaced with vital payload that adds up to important extra profit.

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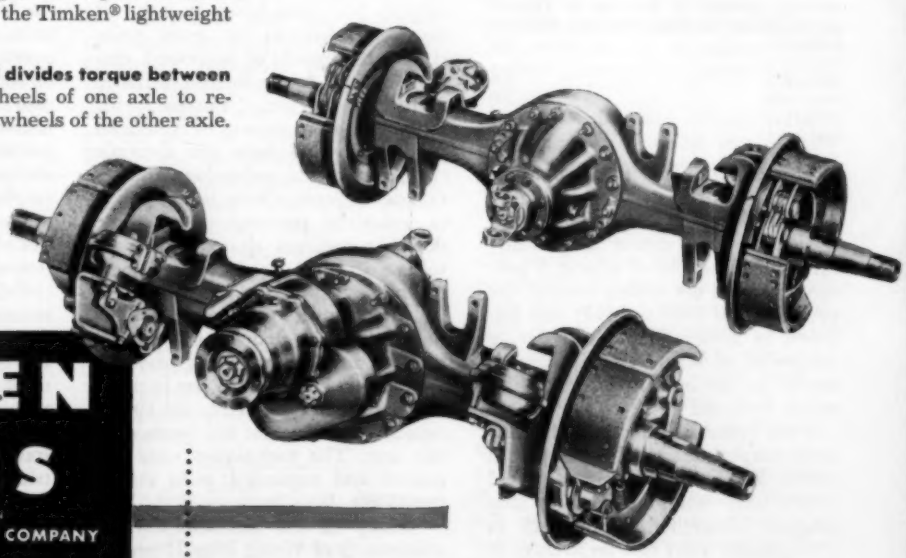

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Labor Developments

By S. HERBERT UNTERBERGER
S. Herbert Unterberger and Company
Economists-Consultants on Labor and Industrial Relations
Washington, D.C. - Philadelphia, Pa.

Productivity

IN a recent report, the Bureau of Labor Statistics provides what may turn out to be the most heartening news of all when it says, "Productivity in manufacturing—one of the most important sectors in the nation's economy—is continuing to rise." The Bureau goes on to point out the significance of this finding as follows: "Gains in productivity provide the means for increasing living and leisure time. They also provide the means for lowering costs of production which can, in turn, bring business expansion, lower prices, higher wages, or increased profits, singly or in combination." In short, rising productivity is the only assurance of economic progress.

In this report, the Bureau has provided statistics back in 1939 on changes in productivity in the manufacturing industry. They have employed the usual measure for this purpose, of output per man-hour. The data are as follows:

Average Annual % Increase in Output per Man-hour in Manufacturing Industry	
1909-1914	2.9
1914-1919	..
1919-1929	5.3
1929-1939	2.2
1939-1947	.9
1947-1953	3.0

These figures show that while productivity has shown an overall rise, at least since the early 1900's, this rise was by no means at a steady rate. Thus the rise of almost 3 percent a year in the earliest years of the period (from 1909 to 1914) was followed by a virtual standstill during the period of World War I, due primarily to the industrial dislocations which occurred.

Then came a rapid spurt in man-hour output during the prosperous 1920's. Even the seriously depressed 1930's were not so bad as to stop progress altogether. From 1929 to 1939, productivity rose an average of about 2 percent a year.

The figures for the years 1939 to 1947 again showed how war and the accompanying interruptions to industrial activity practically halt the wheels of progress. This period shows only the most meager productivity improvement.

The post-World War II years showed a return to a rate of productivity increase of about 3 percent a year. This has become the expected normal rate of increase to which the American economy appears to be geared. For the entire period of 1909 to 1939, the average increase was also about 3 percent a year. This, of course, is an encouraging figure. It implies a doubling of our output per man-hour approximately every 30 years.

It is clear from the foregoing history that productivity increases—that is, progress is greater—in years of prosperity than in periods of depression, but disappears almost completely in war years.

Source of Increased Productivity

The cause of large increases in output per man-hour is not, of course, exclusively or even principally the result of increased employee effort. As the Bureau of Labor Statistics points out, "A major factor in the long-term growth of American productivity has been the dynamic character of its technology. Scientific developments have been applied to industrial processes — sometimes slowly, sometimes dramatically—resulting in new products and new techniques.

"After World War I mass-production techniques changed the character of many industries and played a major role in the sharp rise in productivity which occurred in the 1920's, especially in the first few years after the war. The techniques were improved and expanded, even during the 1930's.

"Many of the technological developments of World War II proved beneficial in the years after 1947. Highly specialized machines came into greater use for particular operations in the production process. The use of material-handling equipment became more widespread. New materials, such as plastics and synthetic fibers, became widely used."

Future of Productivity Increases

The likelihood of future increases in man-hour output is so great that many persons have become alarmed about the possible consequences. Most of the discussion has centered around the slogan word "automation."

The most intensive study since the 1930's of the effects of technological change was conducted last October, when 26 leaders in various fields testified at Congressional hearings on automation. The hearings showed that there was general agreement that automation is probably not a radical departure from the trend toward improved production methods and improved equipment to accomplish that objective. At most it represents a possibility for acceleration of that trend.

It is the possible acceleration which is raising the questions. In this connection, Walter Reuther, president of the United Automobile Workers, expressed his belief that, "Instead of average annual productivity increases of some 3 to 4 percent, the annual rate of rising man-hour output in the national economy may reach 5 or 6 percent or more . . . (a rate) capable of displacing about 3,500,000 or more employees each year, if the national economy fails to expand, along with the rapid improvements in productive efficiency."

Other witnesses disagreed with this estimate of the number of jobs that would be affected. However, there was general agreement on the nature of changes in skills and occupational requirements which was summed up by Secretary of Labor Mitchell's statement: "Improvements in industrial technology will reduce the number of boring, routine, and repetitious jobs. And I believe we can expect that this will move all workers to a higher level of attainment and self-development. We can expect to see increased demand for workers with a high sense of responsibility and versatility, for mathematicians, engi-

neers, and technicians of all sorts, and for scientists and researchers. The worker of the future will require better basic education and better training than he gets now."

Finally, the Department of Labor published studies of what happened in two firms which had installed advanced types of automated equipment, a large manufacturer of radio and television sets and a large insurance company. Their findings should do much to eliminate many of the fears associated with this new development.

The Labor Department reports that, "new jobs are created for which, with some exceptions, brief on-the-job training sufficed. New branches of work were developed to plan for, install, and service new automatic equipment. Some new skills were required. In neither firm did the machines replace workers performing work requiring a high degree of judgment. Nor did their introduction eliminate all hard labor. The electronics manufacturer found hand labor imperative in tasks requiring fine hand movements and involving the use of fragile materials. At that firm increased responsibility and some differences in work conditions that followed the introduction of automation led to higher pay on automated jobs; expanded output through increased productivity was expected to offset any reduction in plant employment. After the installation of the digital computer at the insurance firm's home office, employees performing the new functions averaged higher annual salaries than those who worked with the old setup."

Marquette Expansion Plan Assures Adequate Cement To Mississippi, Louisiana

Assurance of more than ample cement for all needs in Mississippi and throughout the river delta area for many years to come was given recently in an announcement by officials of the Marquette Cement Manufacturing Company. A program will be launched to double the producing capacity of the company's Brandon, Miss., plant and to increase its river distribution system with a major cement handling operation at Vicksburg.

Marquette President W. A. Wecker stated that prompt installation of a new 450-ft. kiln and related production equipment will increase the Brandon plant capacity from 1,250,000 bbl. to 2,500,000 bbl. annually. Planning and engineering work has started, and the big expansion is scheduled for competition by May, 1957—in time to provide plenty of cement for next year's building season.

It was also announced that Marquette will build a modern barge-loading terminal on the Yazoo Canal site in Vicksburg, which it has owned for many years, and to build a fleet of river barges. These facilities will be used to service large construction jobs along the Mississippi River between Helena, Ark., and Baton Rouge, La. A large portion of the increased production at Brandon will be distributed through this Vicksburg terminal.

The Brandon plant, one of eight operated by Marquette, originally was planned for construction at Vicksburg a decade ago, but subsequent thorough surveys disclosed no limestone raw material deposits in the area where extraction costs were within the essential limits of efficient operation. Testing therefore proceeded eastward from Vicksburg until the company proved out satisfactory limestone and marl deposits at Brandon, where the plant was built in 1951.

Brandon plant cement is marketed largely through the Marquette sales office at Jackson, Miss., which is headed by Henry W. Graupner.

Mr. Graupner stated that Marquette studies of the area served by the Brandon plant indicated progressive though gradual increases in cement consumption through 1960. "Our region will need more cement, but users now need have no concern about an adequate supply," Mr. Graupner declared, pointing out that established out-of-state cement manufacturers who help supply this region, such as the plant at Baton Rouge, are also substantially increasing their plant capacities. Between Marquette and these other established suppliers, added capacity scheduled this year and next will exceed 12,500,000 bbl., or more than the combined estimated requirements of Mississippi and Louisiana through 1960. Mississippi and Louisiana currently consume only 9,000,000 bbl. Total capacity of these plants by the end of next year will be nearly 48,000,000 bbl.

RICHARD C. NEWBOLD, formerly president of Lehigh Navigation Coal Sales Company, has joined George F. Pettinos, Inc., Philadelphia, Pa., producers of industrial sands and supplies, as vice-president in charge of sales.

Uranium Industry

(*From page 77*)

more costly materials, to withstand the effects of the gas and to protect personnel against leakage. Special materials were developed in some instances to handle the hexafluoride, and because of their unique resistance to corrosion they may some day find other industrial applications which will benefit the country.

The uranium hexafluoride enriched in uranium-235 which finally reaches the end of the screening process is treated chemically to remove the fluorine and leave the fissionable element, uranium-235. This strategic metal is measured not in tons or pounds of production units, but in grams!

The Oak Ridge gaseous diffusion plant, initially constructed at a cost of about $400,000,000, was expanded after World War II at a cost of $130,000,000. A second expansion program initiated in 1953 will cost another estimated $260,000,000. The total cost will be almost $790,000,000. The other facility operated by Union Carbide at Paducah, Ky., cost about $800,000,000 to erect, and the Goodyear separation plant in Pike County, Ohio, an estimated $950,000,000! Prices such as these for one installation might even make a General Motors executive take a second look.

Fissionable uranium-235, like its relative plutonium, is a major constituent of the diversified nuclear weapons produced for our defense stockpile. The whereabouts of the assembly and storage of the "A" and "H" weapons is, of course, well-guarded information. Let us hope it remains so.

It is most fervently hoped that the possibilities of peaceful uses of nuclear energy may become a reality in our generation. As you can see, the efforts and money involved in producing uranium and its fissionable products are great. It is indeed regrettable that such a precious metal must be used as an implement of war. A more happy thought would be a future complete with uranium-fueled ships, planes, and central power stations, resulting in a savings of man's important natural resources. To this effect the government and industry are co-operating in the development of nuclear power, and for several years important new uses of radio isotopes in medical, industrial and agricultural fields have been recognized. Perhaps, in time, our atomic "swords" may be transformed into atomic "plowshares".

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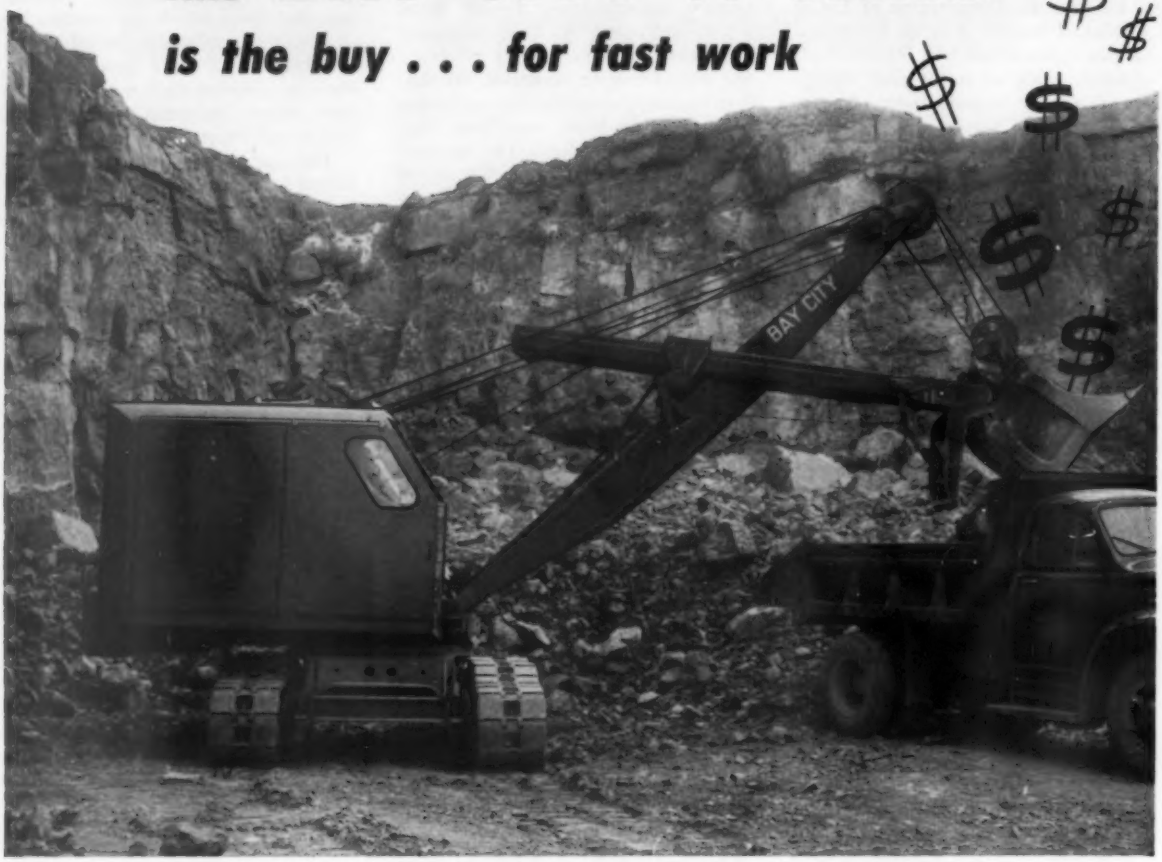

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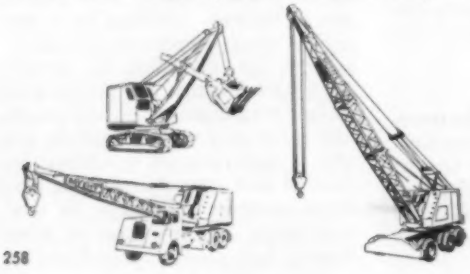

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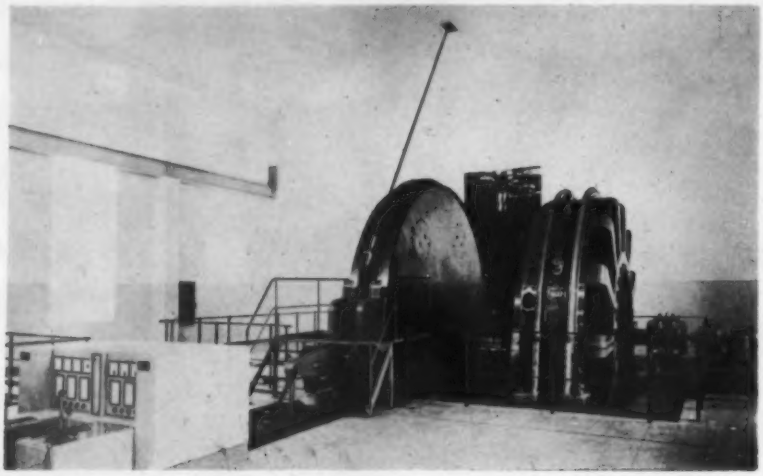
GENERAL REFRACTORIES

Automatic Skip Winding Gear Installed in German Potash Mine

By JOHN GRINDROD



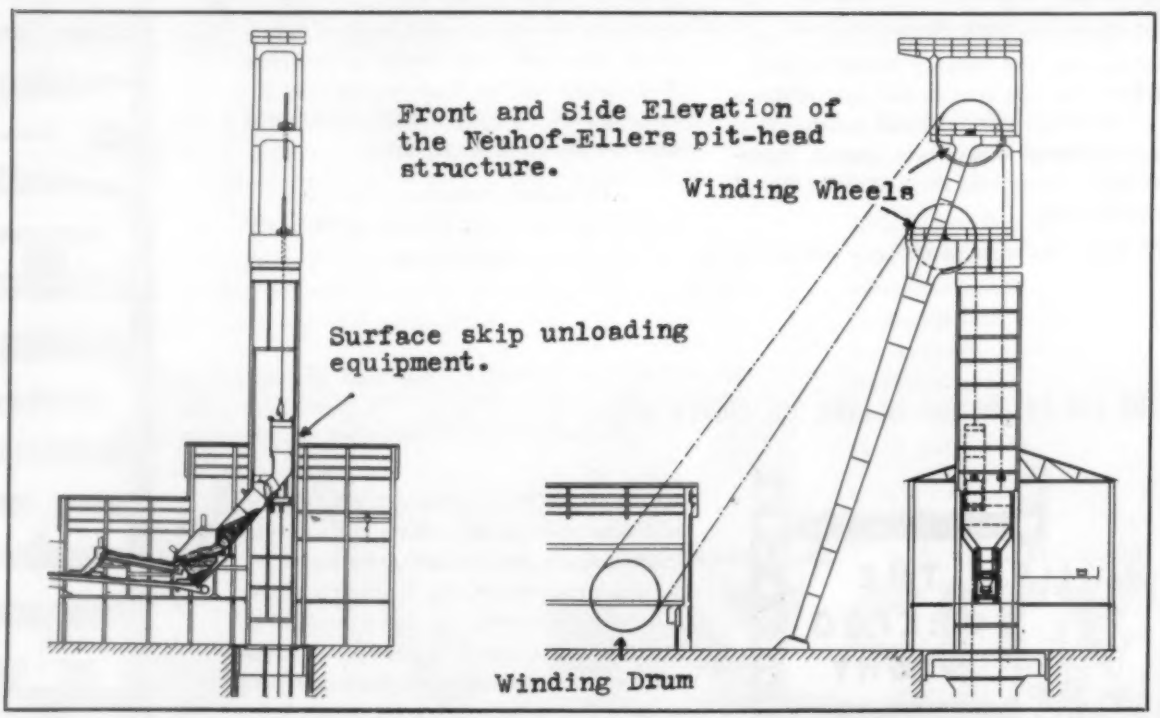
The skip winding gear and motors at the Neuhof-Ellers potash mine.

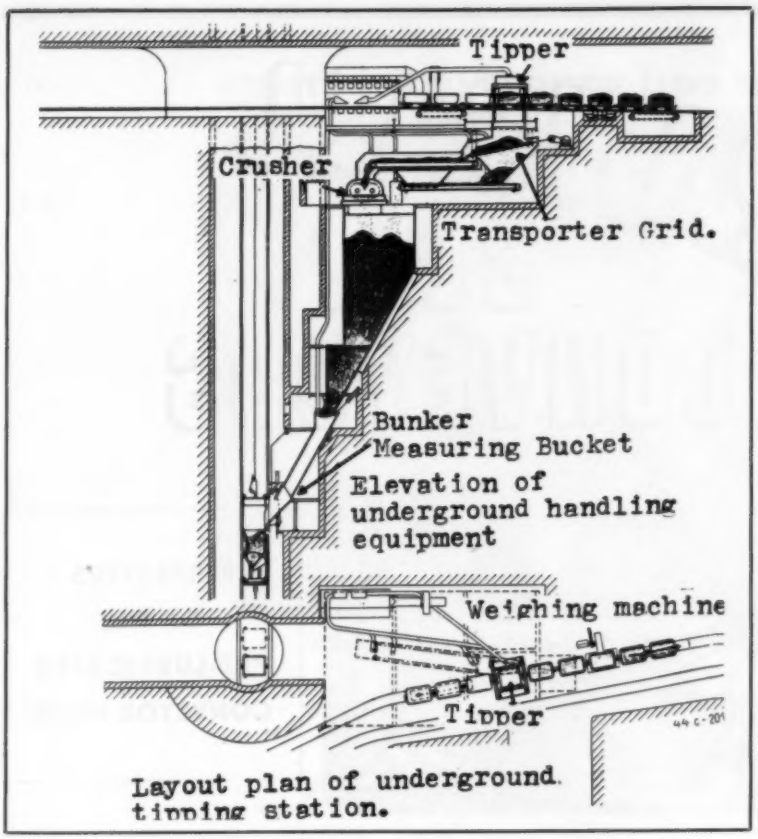
A NEW skip winding gear capable of fully automatic operation, claimed to be the first of its kind in the world, has been installed at the Neuhof-Ellers potash mine in Germany. This operation, located between Fulda and Frankfurt, belongs to Wintershall AG. of Kassel. Since the installation of the gear the mine, which had been unworked for almost 30 years, has now been brought into production again.

Skip Compagnie G.m.b.H. of Essen is responsible for the modernization of the winding and the underground potash-handling arrangements at Neuhof-Ellers. Skip Cie. is a joint venture of Demag AG. of Duisburg, Siemens-Schuckert-Werke of Erlangen, and Siemens and Halske of Essen. Demag supplied the mechanical part of the equipment, Siemens-Schuckert-Werke the main motor and its Ward-Leonard control, and Siemens and Halske the signalling equipment.

The potash is brought to a delivery station near the main shaft, 539 meters below the surface, in trains hauled by an electric locomotive. Each freight car holds 3 tons of potash. At the delivery station the cars, after being weighed, are taken by endless chain drive to a tipping installation where the potash is dumped from each wagon as it passes through the plant. The wagons are tipped lengthwise by means of rotary couplings, and it is unncessary to break the train for this purpose. When all the wagons making up the train have been emptied, they are routed back into the mine for refilling.

From the wagons, the potash falls onto a chute which delivers it to an inclined transporter grid. This device accomplishes the segregation of the fines from the lumps. The former drop through the grid arrangement for delivery to a storage bunker and the latter pass forward to a crusher for reduction to the required size


Front and Side Elevation of the Neuhof-Ellers pit-head structure.
Winding Wheels
Surface skip unloading equipment.
Winding Drum



Layout plan of underground tipping station.

and ultimately reach the storage bunker.

Material in this bunker, which has a capacity of 500 cu.m., or about 650 tons, discharges through a hopper into two measuring buckets, which have the same volume as the skips used to take the salt to the surface. In this way the storage bunker acts as a buffer between the tipping station and the hoisting installation. The hoist itself travels down the shaft to a depth of 597 ft., the level at which the potash is fed into the skip from the bunker.

The timber-lined shaft had also previously been equipped with guide beams; and to meet these conditions the top of the skip has two sets of three pneumatic tired wheels which run on the guide beams as the hoist travels up and down. The skip is also equipped with fixed shoes, which, although they do not normally operate on the guide beams, would wedge themselves on the thickened ends of the beams if the skip should overun its permitted travel. As a further safety precaution, spring-loaded safety clamps are also provided. These would engage with the guide beams in the event of a break in the rope.

With a present capacity of 300 t.p.h., the winding gear will ultimately have a capacity of 612 tons per hour when a second motor is added later. The addition of the second motor is also expected to cut the overall time for completing the fully automatic cycle of operations, including stops, from 72 seconds to 70.5 seconds, the average winding speed remaining unaltered at 14 m. per second.

This means that the present 6,000-kg. carrying capacity of the winder will be doubled in due course. As now installed, it is driven by a d.-c. electric motor rated at 1,010 kw., with an effective torque of 22 metric tons and running at 44.6 r.p.m. The Ward-Leonard control consists of a 1,270 kw. ± 600 v. generator coupled to a 1,120 kw. 990 r.p.m. converter motor, which, in turn, is connected to 5.5 kw. three-phase mains.

Electrically welded, each of the 5,500-mm. diameter wheels in the pit-head structure is designed for a working load on the rope of 30,000 kg., while the headgear as a whole is designed for an ultimate rope-breaking load of 240 tons.

The whole series of operations involved in bringing the potash from the base of the shaft to the surface is fully automatic. The equipment for filling the skips is remotely controlled by compressed air; and the timing of the sequence of operations, achieved by limit switches and time relays, is so arranged that there is always a measuring bucket waiting to fill an empty skip upon its arrival at the base of the shaft.

Private and Public Projects Give New Year Good Start

Heavy engineering construction contracts poured in during January at a rate of $398,000,000 per week, a new all-time high for the month. This is 5.5 percent above the previous January (1953) high of $377,000,000. Thus total January awards of $1,592,800,000, up 23 percent from a year ago, got the year off to a flying start. Private awards of $866,800,000 surged ahead 8 percent over the figure of a year ago, despite the 16 percent decline in private mass housing awards. But public projects of $726,000,000 commanded major attention in January, with a new record for the month, 48 percent above that of a year ago.

Industrial contracts of $259,200,000, up 13 percent over 1955, constitute the best January since 1953; and commercial contracts of $198,700,000 shot up 106 percent over the figure of a year ago, with the gains distributed over all sections of the country.

Residential mass housing contracts declined in January to $373,300,000, compared with last year's big $442,300,000. However, on a weekly average basis, contracts were 6 percent ahead of the previous month.

Public projects turned out to be star performers in January, setting a new high for the month. State and municipal work of $531,400,000, up 63 percent over the amount last year, was boosted by the best volume of highway awards on record for January, $146,500,000, 23 percent over the January, 1955, record.

Public buildings (excluding housing) valued at $193,200,000 went into contract in January, the best volume for the month since January, 1953, and a gain of 20 percent over last year. Unclassified public projects of $104,200,000 are a good 26 percent ahead of 1955.

Completion of remodeling work at the Portland Cement Association's new and expanded quarters in St. Louis, Mo., was marked by an open house on February 7. The new P.C.A. headquarters are in the Syndicate Trust Building, 915 Olive Street.

TRANSALL BELT CONVEYORS

PERFECTERS OF THE PRE-LUBRICATED CONVEYOR IDLER

Transall STACKER was designed to meet a special storage problem for Stockbridge Stone Company. The stacker belt is 36" wide and approximately 150' centers operating at an angle of 18°. It was designed to handle 525 TPH of minus 8½" limestone at a belt speed of 340 FPM.

STACKER can be moved back and forth while operating full load. Movement of stacker is accomplished by push button control located adjacent to the primary crusher. The crusher operator can move the stacker into any desired position for storing various grades of rock as they are delivered to the crusher.

The Stockbridge Stone Company, Calera, Alabama, chose Transall conveying equipment for their new plant because they and their affiliate companies have been using Transall equipment in their other plants for many years.

The stacker, of course, is the focal point of this job in that it is unique in design. Here again the ingenuity of Transall Engineers has been demonstrated. If you have a storage and reclaim problem, please feel free to consult us, there is no obligation.

In addition to the original thinking that went into the stacker design, other interesting features were engineered into this job. For instance, 35° impact idlers were used at all loading points to eliminate skirt plates (which are always a hazard). Thirty-five degree idlers were also used on the tunnel belts which made it possible to load these belts at a number of points without the use of skirt boards. "V" shaped plows were located in front of each tail pulley. Sloping shields were furnished over the pulleys on all vertical take-ups to shed material; thus preventing stone from getting between belt and take-up pulleys. Rock box type transfer and loading chutes were used throughout and were made of wear resisting steel.

The 35° impact idlers have proved exceptionally successful not only on this job, but on many similar jobs. Operators are finding that the elimination of skirt plates have in many cases avoided costly accidents to their conveyor belts and have reduced belt wear. WHY DON'T YOU TRY OUR 35° IMPACT IDLERS?

PLEASE SEND FOR YOUR COPY OF OUR NEW BELT CONVEYOR BULLETIN #915 DESCRIBING OUR PRE-LUBRICATED IDLERS

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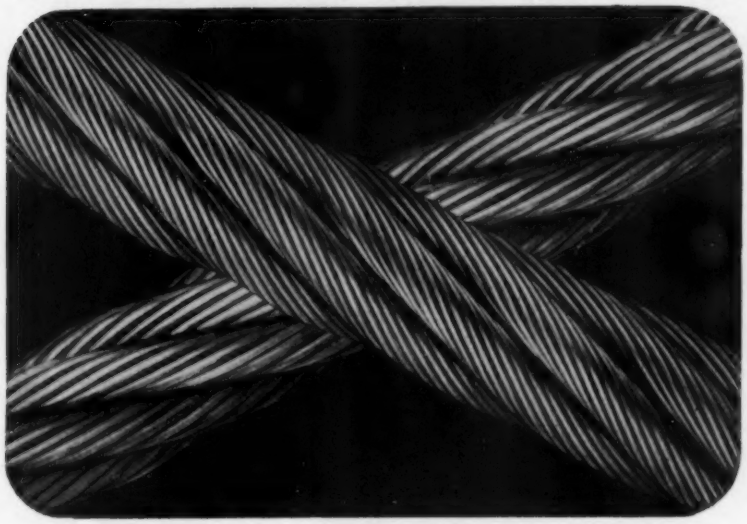

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New Gravel Plant on Ohio River Designed for River Shipment

The 2-cu. yd. dragline loading one of two 13-cu. yd. bottom-dump tractor-trailer units at the Richards pit.

Another ON THE SPOT Report

THE approaching atomic energy age and the spread of industrialization to new areas have already had a marked effect on the southeastern part of Ohio, along the Ohio River. Along with this boom there has been a growing demand for aggregates for building construction. The firm of Richards & Son Ltd., for instance, in July, 1952, completed a 100-t.p.h. sand and gravel plant at Cheshire, Ohio, to supply material for the construction of the Kyger Creek Power Plant. After the dam was completed, this plant was kept in operation to supply local demands. This plant had no facilities for barge shipment, however; so late in 1954 construction was begun on a new plant at Apple Valley, 25 miles east and up river from Cheshire, to supply river work and various types of commercial work along the river.

The Apple Valley plant went into operation in May, 1955. Designed to handle an 150-t.p.h. input, this plant is now producing 100 to 125 t.p.h. of usable material.

The deposit is located on high land away from the river and has 4 to 9 ft. of overburden which is removed with the same equipment used for the aggregates. There is considerable silt near the top of the deposit, but farther down it is well graded. When the pit is further developed, it will be almost entirely usable material, and the output of the plant should equal or exceed its rated capacity of 150 t.p.h.

Digging has reached a depth of 30 ft.; and it is done by a Northwest 80D crawler dragline with a 70-ft. boom and a 2-cu. yd. Page bucket. The dragline is powered by a Murphy diesel engine. Two Euclid 13-cu. yd. bottom-dump tractor-trailers haul ¼ mile downgrade to the plant. There they discharge from an earth-fill ramp over a 12-ft. rail grizzly into a 25-cu. yd. hopper.

The material is discharged from the hopper by a reciprocating plate feeder onto the 24-in. by 183-ft. belt conveyor to the top of the plant. At present a picker removes clay, oversize, etc., from the material, but this will not be necessary after the surface material in the deposit has been excavated. The conveyor discharges into an 8- by 14-ft. Pioneer revolving

Tractor-trailer unit discharging its load into a 25-cu. yd. hopper over plant conveyor. Return conveyor from crusher is at left.

A view of plant with picker on the main belt conveyor at the right. In the background is the plant repair shop.

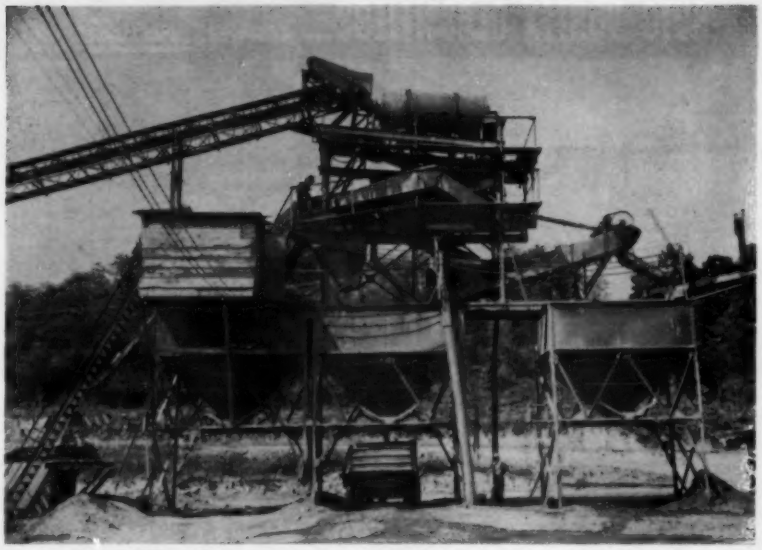
scrubber containing a 6½-ft. dia. plate screen with ⅜-in. perforations and baffles. Sprays inside the screen provide the water for washing.

Both materials from the scrubber are discharged on a 4- by 12-ft. Pioneer 3-deck vibrating screen. This is usually equipped with ½-, ¼- and ⅛-in. openings. As shipments are made to both Ohio and West Virginia, the products must meet two sets of specifications, some of the sizes overlapping. The ½- to ¼-in. and the ¼- to ⅛-in. middle sizes go to separate bins.

The plus ½-in. material off the top deck of this screen goes to a 4- by 8-ft. Pioneer 2-deck screen. This unit has 1½- and ¾-in. wire cloth on its top and bottom decks, respectively. Both through sizes go direct to bins. The plus 1½-in. material is chuted to a 24- by 24-in. double-roll crusher set at 1½-in. opening. A 24-in. by 77-ft. belt conveyor carries the crushed gravel back to the main conveyor in a closed circuit.

The minus ⅛-in. material through the bottom deck of the first screen is flumed to a 24-in. by 20-ft. Eagle double-screw washer. A 20-in. by 105-ft. belt conveyor stockpiles the dewatered sand.

Some of the shipments are made by trucks, and these are weighed on a Bonded Scale Company truck scale. Barges are loaded with gravel by hauling it in trucks about 200 ft. from the bins to a hopper at the river bank. A 24-in. by 75-ft. belt conveyor discharges into the barges. A bulldozer moves the sand from the stockpile to the barge-loading hopper.



The main plant structure, showing the revolving scrubber, the vibrating screen and sand screw, and the crusher (left).

Shipments are made in 1,000-ton standard steel barges, which are accurately loaded by water displacement. Because of the wide fluctuation in river level—usually at least 30 ft. from low to high—there is no dock. Barges are tied up to clusters of piling, and a winch is used for spotting and moving them. Towing is done on call by the Point Towing Company, Point Pleasant, Ohio. Deliveries are made as far as Charleston and Montgomery, W. Va.,—90 miles up the Kanawha River, and up and down the Ohio River.

Waste water from the sand screw goes to a series of settling ponds and finally to the river. Wash water for the plant is supplied by a pump on a float anchored to piling, so that it can go up and down with the river level.

M. W. Richards, the father in this partnership, was a contractor who started his first sand and gravel business over 50 years ago in Minnesota. Later he joined the Hallett Construction Company and was active in their construction and aggregate production activities until his retirement in 1952. His son, C. D. Richards, also worked for Hallett and other companies, chiefly on construction work, until 1952, when he joined his father in this present project. Arthur Sylvester is superintendent of the Apple Grove plant, and Leo Stillwell is superintendent at Cheshire.

The hopper from which products—sand in this case—are loaded into barges tied to piles (middle background).

Appointment of KEVIN W. GANNON to sales manager of the Lime City Stone Company, Toledo, Ohio, and AUGUST GERTH, to plant superintendent, has been announced.

Mr. Gannon who was formerly on the staff of Lucas County as an engineer, joined Lime City Stone last year when it opened the quarry at Lime City for the production of a full line of crushed limestones. Mr. Gerth joined the company after operating the Monroe County Stone Quarry, Maybee, Mich., for 26 years.

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REBUILT PUTNAM-HAWLEY PLANT MEETS GREATER AGGREGATE DEMAND

The generally finer material present in Putnam-Hawley's pit is evident in this view of the pit shovel and haulage unit. Bench intervals of 18 ft. are employed.

Another P&D Exclusive

THE air of feverish construction activity surrounding the St. Lawrence Seaway and New York State Power Authority projects in upstate New York has spurred a number of aggregates

By BUREN C. HEROD

producers in that area toward greater efforts in meeting the increasing demand for this vital material. One of these operators—Putnam-Hawley Building Materials, Inc., of Potsdam, N. Y.—has, despite a relatively modest status in the overall picture, achieved a very creditable record in the expansion and improvement of its sand and gravel production facilities.

A wooden plant of 50 t.p.h. capacity, erected in 1946, has been replaced by a new plant layout that went into full operation on May 2, 1955, with a fourfold increase in hourly production. This expanded output, in addition to furnishing cobbles for dyke construction in Seaway and Power Authority projects, is now supplying an area within a radius of about 50 miles with unsized road gravel and four washed products in the minus 2-in. to sand range. A concrete block plant, operated in conjunction with and on the sand and gravel property, also came in for its share of improvements.

Expansion was based not only on a desire for greater production, but for more efficient utilization of the property; and erection of the new facilities was started in September, 1954, on a different site in the 265-acre tract from that occupied by the older plant structures. The new central location will provide a more favorable haul from the remaining 20-year reserve area of the property. Complete renovation of the operation is evident in the fact that only one item of equipment—a crusher—was transferred from the old plant to the new. The present layout was designed by Guy Coolidge, general superintendent, who states that many of his ideas were obtained from articles on sand and gravel operations published in PIT AND QUARRY.

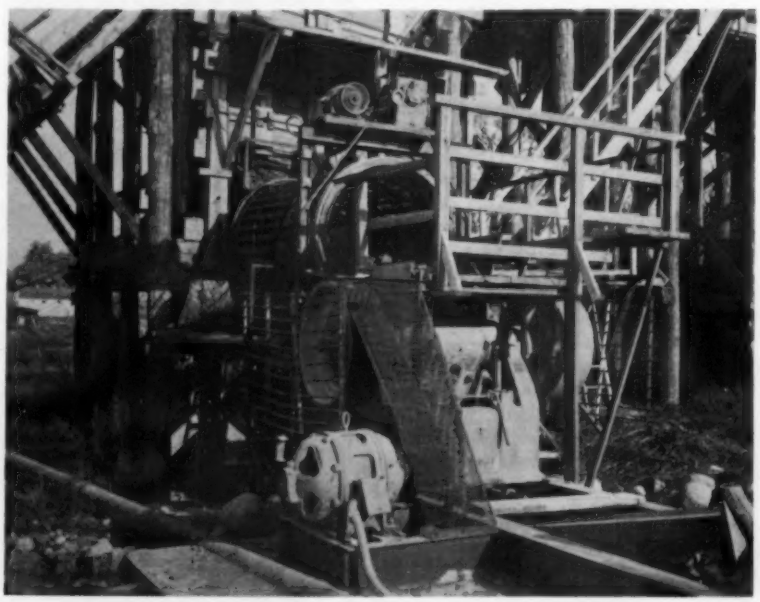
The workable depth of the bank deposit averages about 40 ft., with a normal gradation present from finer sizes above to coarser in the lower levels. About 50 percent of the material in place is sand, and there is very little exceeding 12 in. in size.

A 36-ft. face is presently worked in the pit on 18-ft. benches. A 1¼-cu. yd. Link Belt Speeder shovel is used to load from the face into a pair of 22-ton end-dump Euclid trucks. With a haul of approximately ¼ mile between shovel and plant site, these units have made 40 round trips in 8 hours—carrying 26 tons.

At the plant site the trucks are backed up to the end of a truck ramp erected on 30-ft. pilings and loads are then discharged on a rail grizzly with 16-in. spacing. An insignificant quantity of pit run material is retained on the grizzly, and the balance drops into a 50-ton hopper below. Material is transferred from the hopper on a Universal 30-in. by 5-ft. plate feeder to a company-designed revolving "grizzly".

This unit, 5 ft. in diameter and

A view of the revolving grizzly which was constructed in the company shop. Gravel retained in this unit is fed to the jaw crusher in the foreground.



10 ft. long, was constructed in the company shop by forming two 1- by 4-in. steel bands into circles for the ends and then welding 2-in. rods to the bands on a 3½-in. spacing around the circumference. A 1-in. round-opening screen was then installed on the inside of this cage. The unit is driven at 4½ r.p.m. by a sprocket-and-chain drive with power supplied through a Foote Bros. gear reducer from a 5-hp. motor.

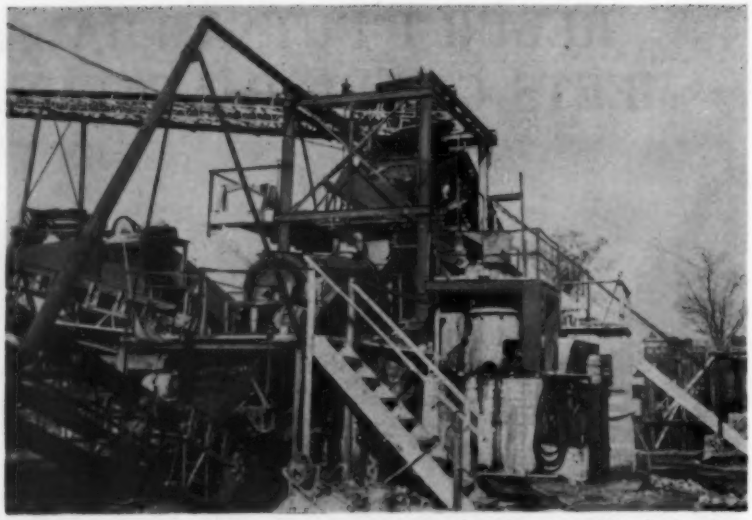
Sand and gravel passing the grizzly screen is dropped to a hopper below, from which it is transferred by a Universal 30-in. by 5-ft. plate feeder to the 24-in. by 18-ft. plant feed conveyor. Gravel retained in the revolving grizzly is discharged to a 20- by 36-in. Universal jaw crusher, which is usually set for 2-in. The crusher product then joins the grizzly throughs on the feed conveyor—a company-built unit—and both are transported to the top of the primary screening tower.

At this point the plant feed can be diverted to an L. B. Smith 24-in. by 100-ft. belt conveyor and carried to stockpile as unsized road gravel, or be discharged to a screen which is the first stage in the main plant flow. When continuing through the processing flow, the material is fed to a 4- by 10-ft. triple-deck Simplicity screen on which the three decks are fitted with 2-in. (top), ½-in. (middle), and ¼-in. (bottom) Wickwire screencloth — the ½-in. middle screen providing protection for the lower deck. Washing is accomplished with spray nozzles installed on both the upper and lower decks.

The plus 2-in. gravel retained on the top deck is chuted to a Kennedy-Van Saun No. 25 gyratory crusher and is reduced through a 1-in. setting. Discharge from this secondary crusher is then returned on an 18-in. by 72-ft. belt conveyor to a transfer point from which it is discharged onto the primary feed belt and carried back to the screen.

Minus ¼-in. throughs passing the bottom deck of the primary screen are split to two washer-classifiers—one an Eagle Iron Works 24-in. by 25-ft. single-screw, and the other a drag-type unit. Discharge from both classifiers is received on a 18-in. by 165-ft. belt conveyor and carried to a concrete sand stockpile which is maintained at about 25,000 tons.

Those sizes retained on the middle



The primary screen (top), secondary gyratory crusher (right), and scrubber (center foreground) can be seen in this view of the primary screening tower. Unsized road gravel is carried to stockpile from the hopper at the top of the tower by the conveyor at the top (left).

An overall view of the operation from the secondary screening tower. The truck hopper and reject chute can be seen in the center background. Sand from the primary tower classifiers is carried to stockpile on the lower of the two conveyors at the left.

From these bins on the secondary screening tower, finished products can be loaded into trucks or discharged to three stockpile conveyors, two of which are visible at the lower center and right.

(minus 2-in. plus ½-in.) and bottom (minus ½- plus ¼-in.) decks are chuted to a 4- by 10-ft. Universal scrubber from which they are discharged to an immediately following 3- by 6-ft. Kennedy-Van Saun double-deck screen for dewatering. As protection for the ⅛-in. lower screen, the upper deck of this unit is fitted with 1-in. opening screen cloth. While the minus ⅛-in. bottom deck throughs are flumed to waste, the balance of the dewatered product is conveyed to the secondary screen tower on an 18-in. by 152-ft. belt.

At the top of this tower the material is discharged over a 4- by 10-ft. triple-deck Simplicity screen on which the top, middle, and bottom decks have 1-, ⅜-, and ⅛-in. openings, respectively. The top and middle decks of this unit are equipped with spray nozzles. Immediately below the screen are three 25-ft. high Erie steel bins—with a total capacity of 68 cu. yd.—into which the three retained sizes are separately chuted, and stored. Each of these finished products can be fed from its bin to one of three 18-in. by 100-ft. belt conveyors and carried to the appropriate stockpile, or it can be loaded directly into trucks.

In producing cobbles for supply to Seaway projects, that part of the flow involving the primary crusher, primary screen, and secondary crusher is altered somewhat. For this purpose, the primary crusher setting is changed to 5½ in., thus providing a larger volume of minus 6- plus 2-in. material in the feed to the primary screen. The top-deck oversize from that screen is then allowed to bypass the secondary crusher and go directly to the conveyor on which the secondary crusher product is normally returned to the main feed belt. At the transfer point to the latter belt, a flop gate provides for chuting these cobbles to a ground pile in lieu of rejoining the feed to the primary screen.

Four shovels are kept at the plant site for direct truck loading from the various stockpiles. These include a ¾-cu. yd. Koehring, a ¾-cu. yd. 20B Bucyrus Erie, and two Michigan TK 6 units. A Barber-Greene bucket loader is used as an auxiliary unit, and a Caterpillar D6 bulldozer is utilized in stripping ahead of the pit or in yard maintenance.

Not long after the company had built the present layout, it was confronted with the necessity for even further expansion. To meet that situation, plans have been made to replace the 24-in. main feed conveyor with a 30-in. unit, and to put a 4- by 10-ft. double-deck screen in tandem with the triple-deck shaker now on the primary tower. In addition, a 36-in. Telsmith crusher, a 20-ft. Eagle Iron Works water scalping tank, and a 36-in. by 25-ft. Eagle Iron Works double-screw sand classifier will be installed. The present sand conveyor will be used exclusively for stockpiling of mason sand, while stockpiling of concrete sand will be handled by a new 24-in. belt conveyor. With these additions and changes, which should be completed during the winter shut-down, the company expects to realize a capacity between 250 and 300 t.p.h.

In addition to providing its building material business with aggregates and furnishing a part of the material needed on the Seaway, the company uses a substantial part of its sand and gravel output in the production of concrete block, turned out in a plant on the same property. The block operation was also improved recently by the replacement of an old hand-operated block machine with a Lith-I-Block machine that produces about 3,500 8-in. equivalent units daily.

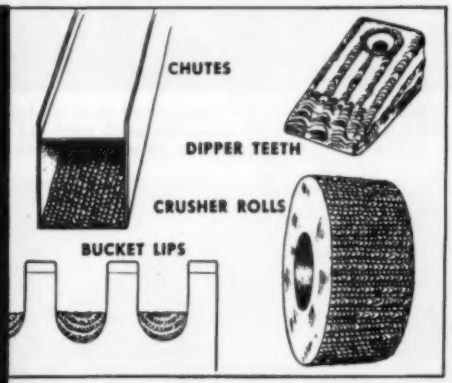
Aggregates for block production are trucked from the stockpile area

When Abrasoweld and Faceweld handle 9 out of 10 hardsurfacing jobs...

Have a full line of buildup and hardsurfacing rods behind them...

Yet cost less to buy...

WHY use anything but LINCOLN hardsurfacing rods



Gets up to 3 times more wear per dollar with...

ABRASOWELD, high alloy carbon-chromium rod for severe impact and abrasion and

FACEWELD, high alloy chromium carbide for severe abrasion, moderate impact.

TRY THESE TWO RODS

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☐ Send me Bulletin SB-1352
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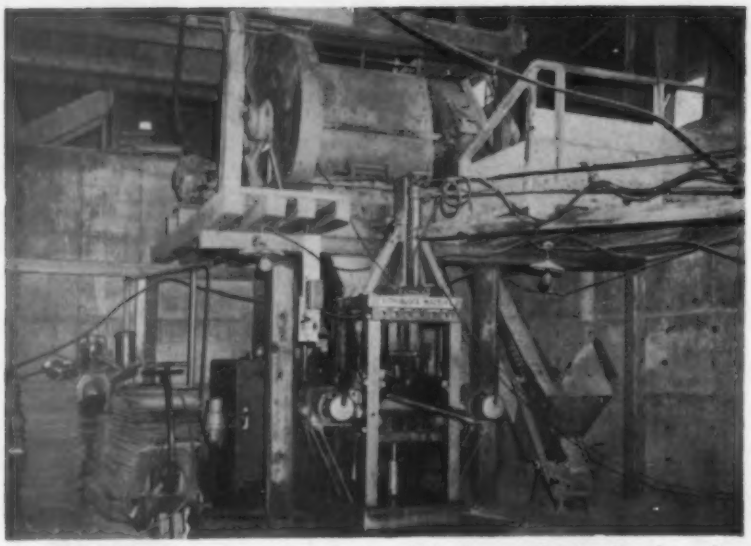

This block machine is a recent replacement of an old hand-operated unit and produces about 3,500 8-in. equivalent units daily. The block plant and the aggregate plant are located on the same property, and aggregates are supplied by the latter.

A view of the block storage yard showing loading for delivery and the equipment (mounted on the trailer) for unloading cubes at the job destination.

All of the stockpiling conveyors presently installed on both screening towers are visible in this view. Loading from the stockpiles is accomplished with four shovels and a bucket loader.

to the top of a ramp adjoining the block plant. They are then dumped into a chute leading to a hopper above the mixing floor. One of the two 20-ton compartments in the hopper is used for sand and the other for No. 1 stone.

On the mixing floor a weigh-batcher suspended from an overhead rail transfers 750 lb. of stone and 1,500 lb. of sand for each batch from the hopper to a 30-cu. ft. Lith-I-Bar mixer, where water and three 100-lb. bags of cement are added. Each batch is mixed for about six to eight minutes and the mixer is then rotated to discharge into the hopper of the Lith-I-Block machine below.

This unit is averaging approximately 8 blocks per minute—two blocks (an end block and a regular block from the same mold) per cycle. Loaded pallets are removed from the machine by an offbearer and placed in racks that will accommodate 72 equivalent units. When full, the racks are transferred from the machine room to the curing and storage yard by a 3-ton Hyster lift truck. During cool weather 22 racks (about half of the daily block output), are left in the machine room overnight. During this time warm air is provided by a Silent Glo portable heater.

In addition to six regular sizes, which include concrete brick and sash block, the company produces a larger unit (8- by 12- by 16-in.) on special order. Local and long distance delivery from the block storage — which accommodates about 100,000 units—is made with a Ford F900 tractor and trailer equipped with a Superlite unloader.

Under the direction of Harold A. Putnam, president, and Guy Cooldidge, general superintendent, this modernized and well integrated aggregate- and block-producing operation will meet the demands made upon it for many years to come.

All officers of the Northwestern Portland Cement Company of Seattle, headed by James D. Burns of Condon, Oreg., chairman of the board, and Gordon Tongue, president, were re-elected at the annual meeting of the company on February 17, 1956.

Other officers are C. T. W. Hollister, Seattle, chairman of the executive committee; Harold Shefelman, Seattle, and Frank Kiernan Jr., Portland, vice-presidents; D. G. Metcalf, Seattle, secretary-treasurer; and W. Johnson, Seattle, assistant secretary-treasurer.

"TOUGH AS A MULE"

–and fast, too!

THAT's the verdict of Ed Walker, job super for H. G. Cozad Construction Co., on a job near Roff, Okla. This agile CAT* DW15, shown with No. 15 Scraper, had just been driven 90 miles in three hours from a shut-down job to this one!

The Caterpillar DW15 is stripping clay overburden so that sand can be quarried for the Roff plant of Mid Continent Glass Co. The big yellow machine works 10 hours a day, six days a week, with time out only for bad weather. According to Ed Walker, "There just isn't any other equipment like Caterpillar machines. They move a lot of dirt without giving us any trouble."

H. G. Cozad is 90% standardized on Caterpillar. In addition to this DW15, the firm owns two Cat DW21s and three DW10s with scrapers, seven Caterpillar track-type Tractors, and a No. 12 Motor Grader. About two-thirds of the equipment is on this job, moving 6000-7000 cu. yd. of overburden per day over a quarter-mile haul.

That's high production, especially with a 100-ft. unfavorable grade on the haul road. The fast-moving DW15 can highball at speeds up to 24 m.p.h. for fast cycle times. Its four-cycle Caterpillar Diesel Engine develops 186 HP, and puts out maximum torque when slugging through tough going with heavy loads. Its companion No. 15 Scraper has a capacity of 15 yd. (heaped), and features fast loading with a live, "boiling" action, and positive ejection of sticky materials.

There's a full line of rugged, fast-working Caterpillar rubber-tired Tractors and Scrapers. Your Caterpillar Dealer – who provides fast service and parts you can trust – will gladly demonstrate the unit best suited to your needs.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

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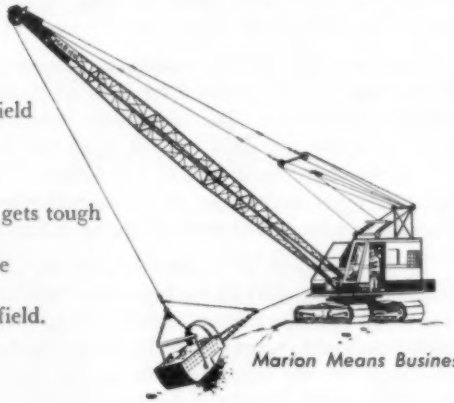
**NAME THE DATE...
YOUR DEALER
WILL DEMONSTRATE**

champions in their field . . .

Point! Flush! Retrieve! You thrill to the brilliant field work of an experienced Irish Setter. A glance tells you his sure-footed poise and his stamina when the going gets tough are the marks of a true champion. You'll recognize these same qualities in Marion's one-yard 43-M, a champion in its field.



Marion Means Business

MARION POWER SHOVEL COMPANY, MARION, OHIO

LINK-BELT offers you COMPLETE, ONE-SOURCE SERVICE

for all your screw conveyor needs

Positive flow of material to storage bin is provided by this 12-in. diameter Helicoid screw conveyor (cover removed for photo).

How this 4-phase service saves you time . . . spares you details

1. **ANALYSIS AND ENGINEERING** service is provided by a district sales office in your area. From long experience, Link-Belt District Engineers can quickly ascertain the best conveying arrangement for you.

2. **COMPLETE LINE OF SCREW CONVEYOR COMPONENTS** and related elevating, conveying and power transmission equipment is your assurance that specific needs will be fulfilled most efficiently and economically.

3. **EASY ERECTION** is achieved because of prefitting, match marking, close-tolerance manufacturing and Link-Belt drawings. Link-Belt will handle entire erection assignment if you wish.

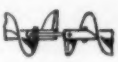
4. **SATISFACTORY PERFORMANCE** is assured when you rely on Link-Belt as a single contract source for your complete system. We will accept full responsibility for placing it in operating readiness.

SCREWS

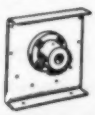
HANGERS

TROUGHS

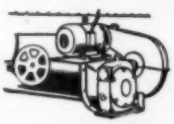
SPOUTS & GATES



SHAFTS & COUPLINGS



TROUGH ENDS



DRIVES

Here's a four-point program that provides quick and easy answers to your screw conveyor problems whether minor or complex. Whatever you need in components . . . and to whatever extent you require engineering supervision—Link-Belt will devise a system "tailored" to your requirements, correlating all factors to assure you of finest performance. For more facts, call your nearby Link-Belt office.

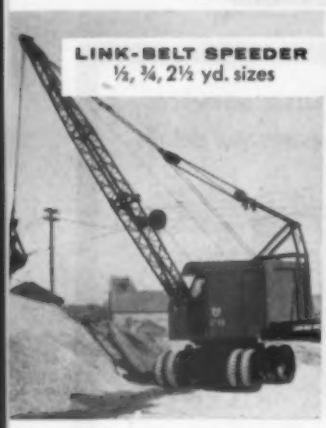
LINK-BELT

SCREW CONVEYOR EQUIPMENT

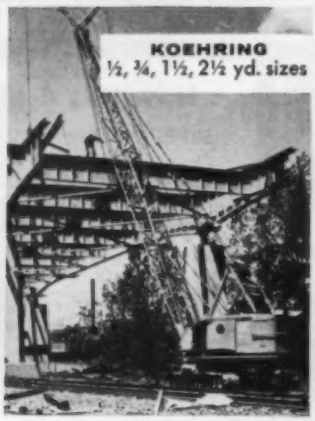
LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office: New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World. 13,913

GET MORE WORK

FROM SHOVELS, CRANES, DRAGLINES

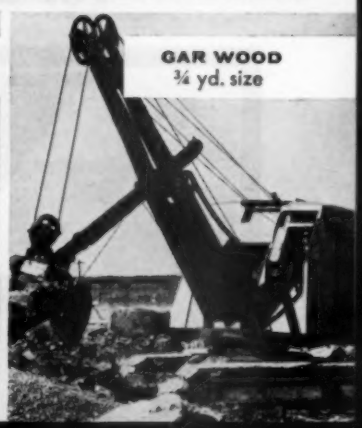


LINK-BELT SPEEDER
½, ¾, 2½ yd. sizes



KOEHRING
½, ¾, 1½, 2½ yd. sizes

BUCYRUS-ERIE
⅜, ½, ¾, 1, 1½, 2, 2½, 3 and 4 yd. sizes



GAR WOOD
¾ yd. size

Specify or install an Allis-Chalmers Diesel or gasoline engine in any of these shovels, cranes or draglines and insure your investment in your machine.

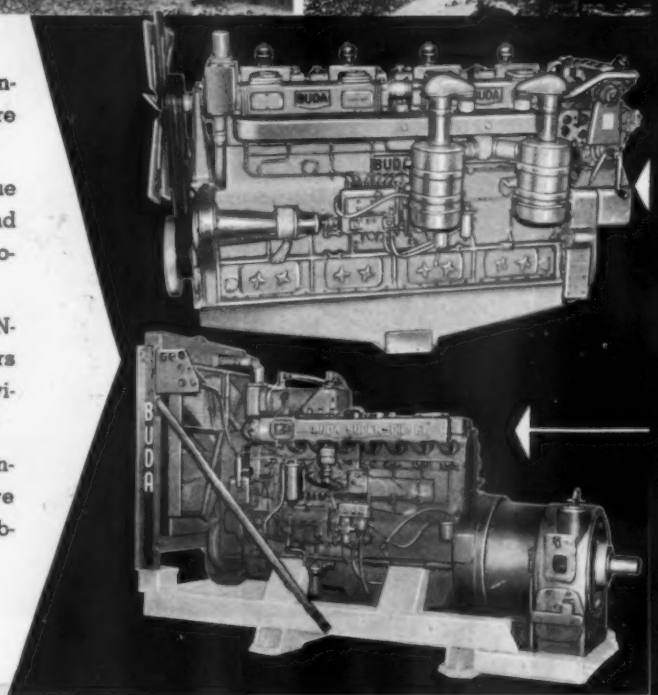
BIG, RUGGED WORKHORSE ENGINES with high torque in the normal operating range, they have the power and stamina to give you smoother, faster cycles for greater production, year in and year out, on any kind of job.

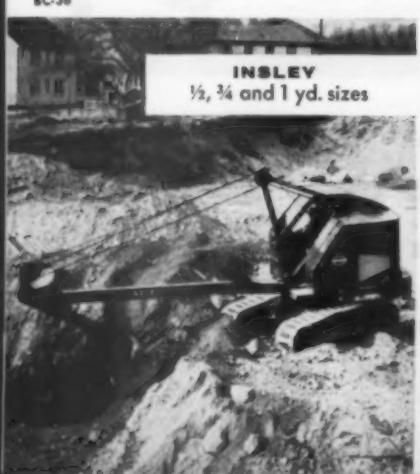
SIMPLE IN DESIGN . . . EASY TO SERVICE AND MAINTAIN—smokeless, quiet and smooth-running, Allis-Chalmers engines are packed with features that will pay you dividends in low cost, high production operation.

FOR EYE OPENING FACTS on how Allis-Chalmers engines make shovels, cranes and draglines more productive at less cost, see your nearby Buda Division Engine Distributor soon.

ALLIS-CHALMERS, BUDA DIVISION, MILWAUKEE 1, WISCONSIN

BC-36





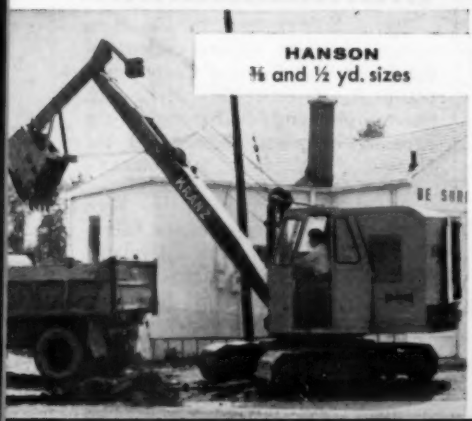
INSLEY
½, ¾ and 1 yd. sizes

AMERICAN
¾ and 1½ yd. sizes

MARION
¾, 1, 2, 2½ yd. sizes

...at less cost

POWERED BY ALLIS-CHALMERS ENGINES



HANSON
⅜ and ½ yd. sizes

P & H
3½ yd. size

QUICK-WAY
¼, ⅓ and ⅜ yd. sizes

FULL RANGE OF DIESEL AND GASOLINE POWER

Diesel

Model 8DC-2505 388 h.p.

Diesel

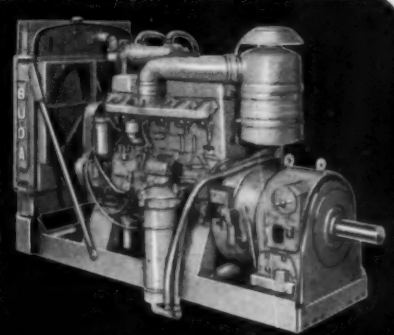
Models 6DA-779, 6DA-844 and 6DA-970 with Torque Converter 185, 215 and 240 h.p.

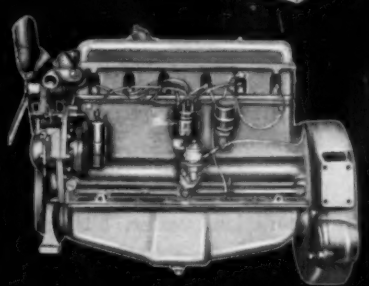
Diesel

Models 8DAS-1125 and 8DAS-1290 with Torque Converter 350 and 375 h.p.

Gasoline

Models 6B-230 and 6B-273 78 and 85 h.p.





SCHIELD BANTAM
⅜ yd. size

SARGENT
⅜ yd. size

LIMA
½, ¾, 1, 1½, 3½ yd. sizes

NORTHWEST
¾, 1 yd. sizes

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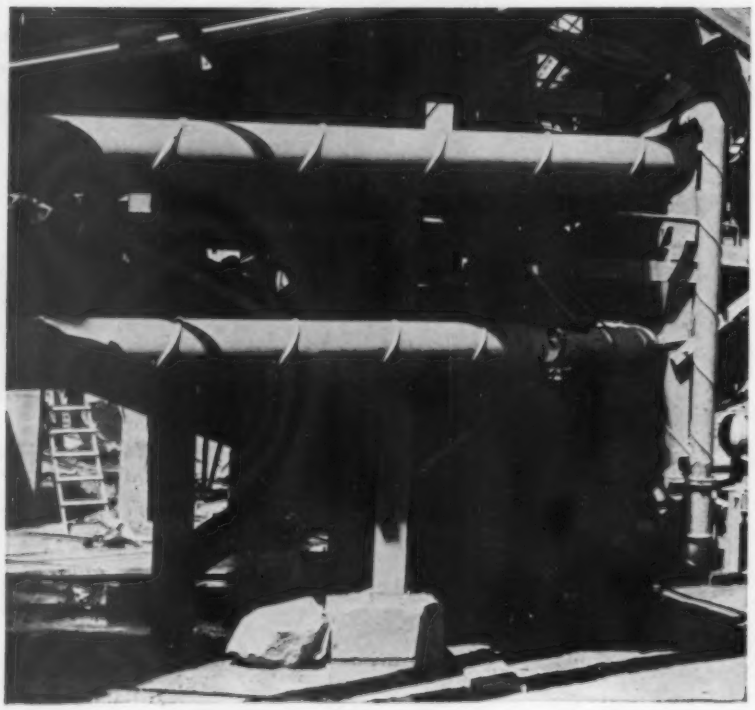
2½, 3 yd. sizes

ALLIS-CHALMERS

There's Extra Performance in Every SPIRAL



The familiar SPIRAL that distinguishes Naylor from all other pipe in mining service is not just an identifying feature. It tells you that the pipe is light in weight, therefore easier and more economical to handle and install. It's your assurance that the pipe is extra strong and extra safe because Naylor's exclusive lockseamed, spiralwelded structure acts as a continuous expansion joint to absorb shock loads, stresses and strains. And it's evidence of the greater collapse strength that permits operation under either vacuum or pressure.

Specify Naylor for high or low pressure air and water lines, ventilating pipe, tailings lines and for other lines — to get this extra performance.

Write for Bulletin No. 507.

NAYLOR PIPE

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1257 East 92nd Street
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Industry Personalities

DAVID E. STEVENS JR. has been named assistant superintendent of the Lone Star Cement Corporation plant in Greencastle, Ind. Mr. Stevens previously had served in the capacity of plant engineer at the Hudson, N. Y., Lone Star plant.

ALLEN W. THOMPSON has been named traffic manager of the Cleveland Quarries Company, Cleveland, Ohio, according to an announcement made by J. C. Kamm, president. Mr. Thompson has been with Cleveland Quarries since 1926.

RICHARD HARRIS has been named to the position of quality supervisor at the Shoals, Ind., plant of the National Gypsum Company. Mr. Harris joined the company as a mill foreman and served successively as a board line foreman, board plant process engineer, and assistant quality supervisor in the National City, Mich., plant.

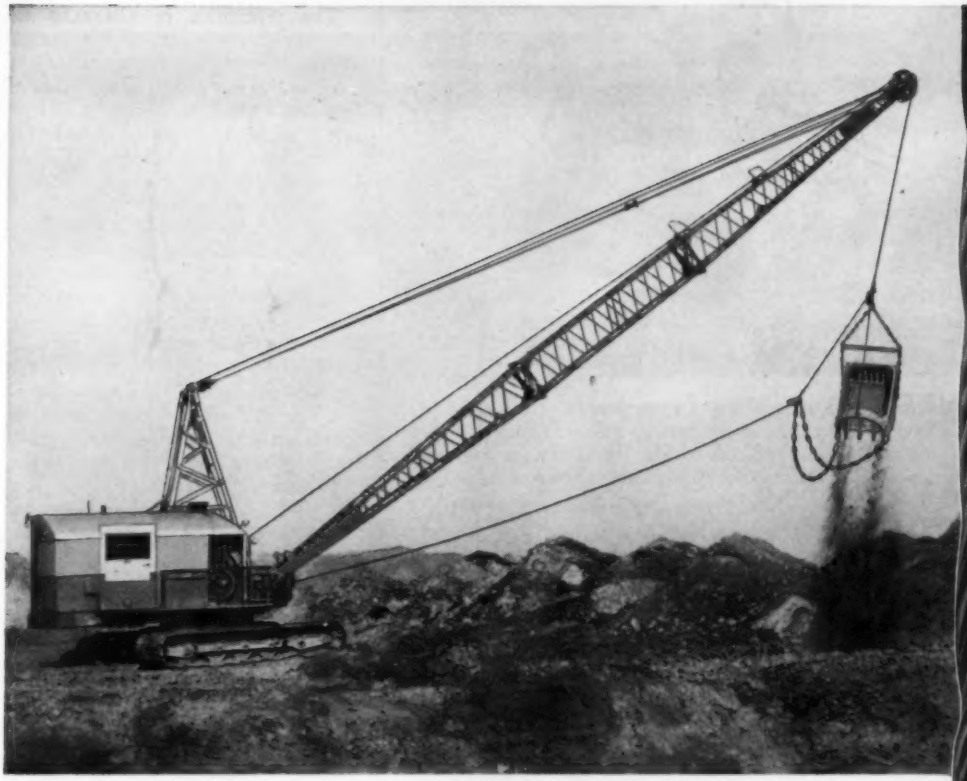
RALPH E. TOWERS has been named assistant sales manager of the Bessemer Limestone and Cement Company. Mr. Towers joined the company 24 years ago as a salesman and later was sales engineer.

REED T. RECKNAGEL, superintendent of the Alpha Portland Cement Company's plant in Cementon, N. Y., has been transferred to the Martin's Creek, Pa., plant. Succeeding Mr. Recknagel at Cementon will be JAMES ANDERSON, from the Jamesville, N. Y., plant.

GEORGE H. SIEMS JR. has been named Maryland paving and public improvements engineer for the Portland Cement Association, according to an announcement made by Robert M. Reindollar Jr., district engineer for P.C.A.

Mr. Siems succeeds JOHN O. HOBBS, who resigned to take a position with the Standard Lime and Cement Company of Baltimore.

T. M. DILWORTH has been appointed sales manager of the Cleveland district of the United States Gypsum Company. He succeeds FRANK M. BELL, who was transferred to the Detroit district.



LAY-SET VHS

15% Stronger • Tougher • More Wear-Resistant

New VHS Dragline Lasts 58% Longer ...at Keller Mines

• Mr. John Oreskovich, Superintendent of Keller Mines, Inc., Beloit, Ohio says: "9 to 12 days used to be about all the life we could expect from the best Improved Plow Steel draglines on this Lima 1201 excavator. However with new VHS we are getting from 19 to 24 days—increasing service life from 58% to over 100%. Naturally we have switched to VHS on every piece of equipment for which a VHS line is made."

Service records like this are becoming commonplace in the mining industry. For new tougher VHS resists abrasion . . . keeps its shape under pressure . . . can't become "hide bound" or lose its flexibility. Developed specifically for draglines, slusher ropes and shovel hoist ropes, it stands up better in these toughest of wire rope applications.

Cuts "Down Time," Saves Money—The longer life you get from new VHS saves you money. And you make additional savings by cutting costly "down time" of equipment for wire rope replacement.

Stronger Too—New VHS, made from a new grade of steel for wire rope, is at least 15% stronger than Improved Plow Steel—the strongest grade available before the introduction of VHS. This means you can handle heavier loads with the same diameter line. And you have a higher factor of safety . . . additional insurance against sudden overstresses.

Easy to Order—You don't need any complicated specifications to order new VHS. Just call your Hazard distributor and ask him for a VHS dragline, shovel hoist rope or slusher rope in the size you want. He has it in stock.

For more information see your Hazard distributor salesman or write to the nearest Hazard office for Bulletin DH-513H

HAZARD WIRE ROPE DIVISION
American Chain & Cable Company, Inc.
Wilkes-Barre, Pa., Atlanta, Chicago, Denver, Houston, Los Angeles, New York, Odessa, Tex., Philadelphia, Pittsburgh, Portland, Ore., San Francisco, Bridgeport, Conn.

SAFETY INSURED—When a 41,300-lb. section of stone crushing equipment was placed by an American 700 Series Crawler Crane, Crosby Clips were used on all wire ropes to assure maximum safety for men and equipment. Genuine drop-forged, hot-dip-galvanized Crosby Clips, with the famous Red-U-Bolt, are specified for safety on more jobs than any other drop-forged wire rope fasteners.

STRONG SAFE, BLOCK

When cofferdam sheetings were about to be drawn from the sucking, grasping soil of the Platte River bottom, a Load-Rated Crosby Crane Block was specified. Made of highest-quality steel, and engineered for safety as well as efficiency, Crosby Blocks are backed by the famous Crosby name—recognized leader in safety. When using Crosby Blocks, workmen can't go wrong, for the safe lifting capacity is embossed right on the side plates.

EASY TAKE-UP

Important design advances by the makers of famous Laughlin Turnbuckles offer added safety and efficiency to users in the construction field. Laughlin Turnbuckle bodies have extra-heavy hex ends which allow fast, easy take-up with a wrench. An exclusive eye design takes the ear of a shackle one size smaller and is stronger than conventional eyes because it conforms more closely to the lines of pull. This design also makes it easier to attach thimbles and other fittings. Exceptionally strong, Laughlin hooks have added heft at points of greatest stress—the ¼-inch hook is actually stronger than most $\frac{5}{16}$-inch hooks. Available in a complete range of sizes. A reference chart in Laughlin's free catalog lets you select the proper size turnbuckle for each job.

ATTACH IN SECONDS

A more efficient clevis grab and slip hook made by Laughlin has a "Crimp Style", cotter that can be removed and attached in seconds. Available in a complete range of sizes at distributors everywhere, Laughlin Clevis Grab and Slip Hooks are made of drop-forged steel special forging quality and are heat-treated for maximum strength. For free catalog on the complete Laughlin and Crosby lines, write the Thomas Laughlin Division, Portland, Maine, or the American Hoist & Derrick Co., St. Paul 1, Minnesota.

The promotion of CHARLES C. JORDAN to the position of manager of corrugated asbestone sales has been announced by the National Gypsum Company. He succeeds the late Donald A. Rosensteele and will make his headquarters in New Orleans.

Mr. Jordan joined National Gypsum Company in 1942 at the Bluebonnet ordnance plant, McGregor, Tex., which the company constructed and operated for the government. The same year he entered the U. S. Army Air Force, serving as a captain until 1946.

Since his return to the company, he has worked as an engineer of plant construction and as administrative assistant for the engineering department. Most recently Mr. Jordan has been regional engineer of Asbestone "400" sales.

Appointment of HAROLD A. LOVEGREEN as assistant sales manager of Calaveras Cement Company has been announced by Mel J. London, Calaveras vice-president in charge of marketing. Mr. Lovegreen will work directly with Mr. London and William G. Jeffrey Jr., dealer sales manager, and will headquarter in the company's San Francisco office. Mr. Lovegreen joined Calaveras in February, 1953, and until recently was stationed in Los Angeles as white cement sales representative for southern California, western Nevada, Arizona, and Utah.

GORDON K. WILSON of Seattle, Wash., has been appointed assistant division sales manager, Pacific Northwest Division of Permanente Cement Company, as announced by James K. Beatty, vice-president in charge of sales for Permanente.

Mr. Wilson joined the Kaiser organization in September, 1945. He became a salesman for Permanente in 1947, and was appointed senior salesman of the Pacific Northwest Division in 1951. His headquarters will be in the company's division sales office in Seattle.

Appointment of DR. RAYMOND WYNKOOP as manager of the general engineering department of International Minerals & Chemical Corporation's Engineering Division was announced by Don T. Grange, director of engineering for the corporation.

Dr. Wynkoop will be responsible for the co-ordination and direction of consulting chemical engineering and general engineering services in International's Engineering Division.

HOW'S THIS FOR PROFITABLE AGGREGATE PRODUCTION?

- Output per 10-hour day—
  200 T. of-⅛"; 300 T. of-½";
  500 T. of-1"; 400 T. of-1¼";
  600 T. of-1⅞"; 400 T. of-3".
- Total daily production — 2400 Tons
- Material — Quarry-run limestone
- Silica content—Approximately 16%

"Our CEDARAPIDS DOUBLE IMPELLER IMPACT BREAKER is doing a real job"

Says Edgar N. Putman, Supt.
NEW HOPE CRUSHED STONE & LIME CO.
New Hope, Pa.

Take it from this quarry operator —producing six sizes of specification material at a steady 240 ton per hour clip is profitable production! "With our 4350H Impact Breaker we're getting good breakage, ample crushing capacity, and operating costs are low," says Edgar Putman.

In addition to the Cedarapids Double Impeller Impact Breaker, the New Hope plant includes a 40"x12' heavy-duty cast steel Apron Feeder and three Horizontal Vibrating Screens — all Cedarapids!

BUILD BETTER ROADS TODAY · FOR A GREATER AMERICA ·
See you at the ROAD SHOW CHICAGO Jan. 28-Feb. 2, 1957
AMERICAN ROAD BUILDERS ASSOCIATION

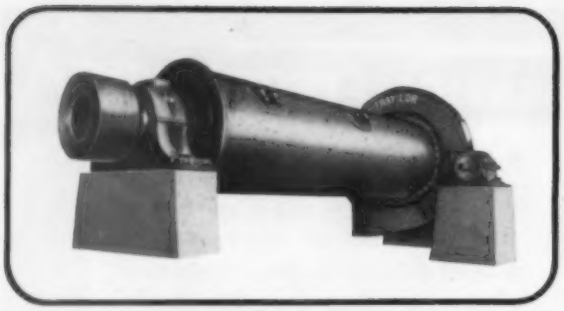
WHAT'S YOUR PRODUCTION PROBLEM?

If you need output of 240 tons per hour, 40 tons per hour, or 800 tons per hour — of finished product ranging from aglime to riprap — there's a Cedarapids portable or stationary aggregate plant built to produce the tonnage you want at the low cost that means extra profit. If you produce bituminous concrete, check the complete line of Cedarapids batch-type and continuous-flow type plants.

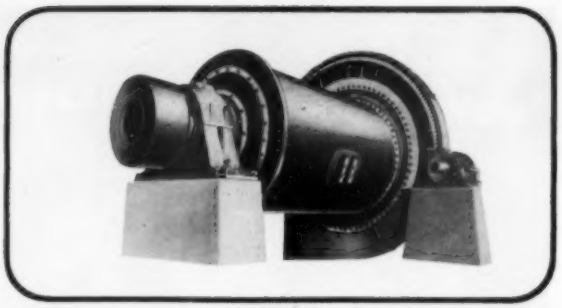
Cedarapids Built by IOWA

IOWA MANUFACTURING COMPANY

Cedar Rapids, Iowa, U.S.A.

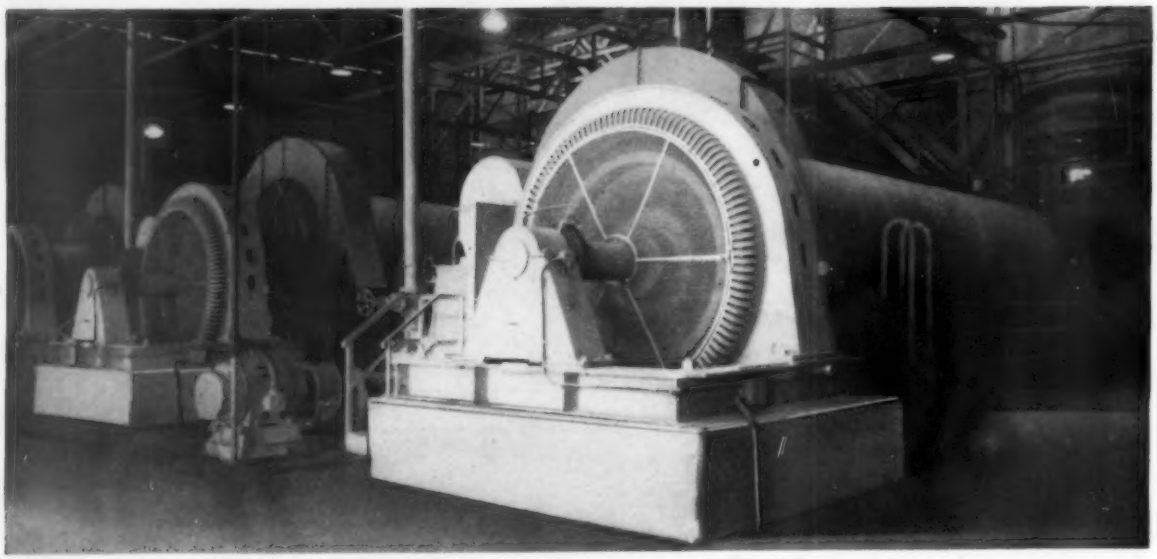


During the starting period, all main bearings on Traylor Grinding Mills are pressure-lubricated. A high pressure pump coats each trunnion with a film of grease which lifts and floats the mill to overcome high starting torques and eliminates undue wear caused by "dry" starting.



Precision-cut steel gears—trunnions cast integral with the detachable heads—shell liners of manganese or alloy steel . . . all indicate the superior design and construction features that are standard with Traylor.

Here's How TRAYLOR Turns Any Grinding Operation to Your Advantage



Traylor Grinding Mills are custom-engineered to exacting specifications developed from two important sources . . . data furnished by you, the customer, and the knowledge of Traylor Engineers gained from more than a half-century of specialized experience.

The application of Traylor experience to your specific requirement makes a "Traylor-Made" Grinding Mill the most logical, advantageous choice for you. Traylor Bulletin #10-121 gives complete specifications and describes the outstanding features of Traylor Grinding Mills. Write for your free copy today.

Traylor

GRINDING MILLS

OIL LUBRICATED BEARINGS

TRAYLOR ENGINEERING & MANUFACTURING COMPANY

848 MILL ST., ALLENTOWN, PA.

SALES OFFICES: New York • Chicago • San Francisco

Canadian Mfr: Canadian Vickers, Ltd., Montreal, P. Q.

PRIMARY GYRATORY CRUSHERS

ROTARY KILNS

SECONDARY GYRATORY CRUSHERS

BALL MILLS

JAW CRUSHERS

APRON FEEDERS

Why the Big "B" Rear-Dump

can cut your hauling costs

Speeds to 34 mph

The new 35-ton capacity B Tournapull Rear-Dump has 10 forward speeds, from 2 mph to 34 mph . . . 2 reverse speeds, 2 and 4 mph. Rapid shift and quick acceleration of 293 hp diesel engine lets you move faster and easier into higher gear ranges.

Improved gradability

Proper distribution of weight forward onto drive wheels allows "B" to go up steep grades.

Fast loading

Large "target" area makes loading fast and simple. Bowl is 17'8" long, 10'2" wide, has maximum depth of 7'6". Rear of body provides wide, low entry which gives excavator faster loadings.

Fingertip control of dumping

The touch of a switch, activates hoist motor to lift body. As body lifts quickly, it swings behind rear wheels to dump clean. Completely streamlined bowl sheds material readily. There is positive control both up and down.

Rugged Construction

Body is heavy steel plate, rigidly reinforced. Three layer bottom consists of heavy bottom plate, thick steel billets and heat treated steel strips to resist wear. Main case of prime-mover is built extra strong . . . will not distort to put strain on power-train.

No hydraulics, springs or hinged steering connections

Problems of conventional rear-dumps are eliminated by simple design of "B" Rear-Dump. Troublesome hydraulics, long driveshafts, springs, spring hangers and hinged steering connections are eliminated. Improved hauler means higher mechanical efficiency and lower maintenance costs on all hauling jobs.

See your LeTourneau-Westinghouse Distributor about the new "B" Rear-Dump today. He can also show you how this unit can be interchanged with a Scraper or Crane, at only about 25% of original total price.

Tournapull—Trademark Reg. U.S. Pat. Off. BR-889-G-b

LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company

There is a *SYNTRON*

VIBRATING SCREEN

Whether you're handling fine powders or big chunks—scalping, coarse or fine screening, dedusting or dewatering—Syntron can provide an effective, low cost Vibrating Screen to accomplish your purpose.

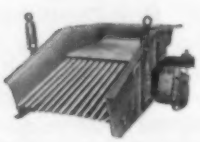
Several types are available—electromagnetic, such as the "VSF" type shown above, or mechanical—with woven wire cloth, wedge slot, flange lip or perforated plate screen surfaces.

Other SYNTRON Equipment of Proven, Dependable Quality

FEEDER MACHINES

SHAFT SEALS

GRIZZLY FEEDERS



WEIGH FEEDERS

SYNTRON COMPANY

385 Carson Avenue Homer City, Penna.

R. E. SANSOM recently was appointed divisions manager of the American Limestone Company, Knoxville, Tenn., according to an announcement made by R. P. Immel, vice-president.

Mr. Immel also announced the appointment of R. B. MCNAB as sales manager of the agricultural limestone divisions of American Limestone.

P. G. HAHN, district sales manager of the Lehigh Portland Cement Company in Spokane, Wash., retired from this post on January 1 after 34 years of service with the firm.

L. R. SNIDER will succeed Mr. Hahn as dictrict manager in Spokane.

EDWARD J. KILLIAN was recently promoted to the post of manager of the National Gypsum Company's Portsmouth, N. H., plant. He had been production superintendent of the Buffalo, N. Y., plant since 1953.

Joining National Gypsum in 1948 as a plant controller, Mr. Killian later worked in the gypsum division of the production department before becoming production superintendent at the Clarence Center, N. Y., plant.

R. P. MITCHELL, formerly assistant sales manager of the Colorado Division, Ideal Cement Company, was recently promoted to the post of sales manager, Spokane Division, with headquarters in Spokane.

ROY NEILL, formerly sales manager at Spokane, was assigned other responsibilities in the sales department.

ROBERT L. ZALE has been named sales promotion manager and BEV BROWER was appointed general commodity advertising manager for the National Gypsum Company.

Mr. Zale joined the company in 1953 as production promotion manager; and Mr. Brower has been advertising manager for asbestos products for the last three years.

Effective January 1, 1946, CHARLES M. ADAMS became assistant manager of operations of the Huron Portland Cement Company, Detroit, Mich. A graduate of the University of Michigan, Mr. Adams joined Huron Portland Cement in March, 1951, as assistant superintendent of plants and vessels. He served as an officer in the Navy from 1943 to 1945. Upon his return to Huron from service he was placed in charge of the firm's distributing plants and vessels.

Clean-up takes only a few minutes per shovel because of Tournatractor's 19 mph forward and 8 mph reverse speeds. In addition to saving time, speedy tractor-on-rubber keeps loading sites and haul roads cleaner because it can get around to each shovel more times per day than a crawler-tractor.

Kaiser Steel Corp.

speeds pit clean-up with Tournatractor

1 rubber-tired rig replaces 2 crawler-tractors

Working their Eagle Mountain Iron Mine, Eagle Mountain, California, Kaiser Steel Corp. find they get more clean-up work done faster with 1 Model C Tournatractor than if they assigned 2 crawler-tractors to handle the same job. The new tractor-on-rubber replaced one full-time crawler, and does the part-time plant and pit maintenance work formerly assigned to a second track-type machine. The change to the faster, more maneuverable 208 hp Tournatractor enables the mine to keep haul units moving with less delays due to spillage or uneven pit floors.

3 to 4 times faster than crawlers

Tournatractor handles all clean-up assignments around 3 shovels. It shuttles back and forth at speeds up to 19 mph, which is 3 to 4 times faster than the top speed of any crawler. In addition, reverse speeds to 8 mph allow unit to back away quickly without interfering with loading operations. Big 21.00 x 25 low-pressure tires provide plenty of flotation and traction. They stand up well despite abrasive and rocky footing around pit floor.

Also used for pulling and pushing

In addition to clean-up and bulldozing, the 208 hp tractor pulls air compressors to drilling sites and moves the frame supports which carry electric cable for shovels, drills, and other equipment.

Get all the facts

Pit owners all around the world are taking advantage of the ease of maintenance, durability, speed, and high production of the Tournatractor. If you are interested in these same benefits for your mine, get all the details from your Distributor today.

Tournatractor—Trademark Reg. U.S. Pat. Off. T-828-M-bww

Tournatractor also cuts downtime for air compressors and other equipment when moving them from one location to another. Tournatractor gets on the job quicker . . . gets to the next assignment quicker. 1500 ft. is less than a minute away.

LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company

Yuba dredge with 6 cu. ft. buckets and 38' digging depth excavating gravel for Canyon Ferry Dam.

BUCKET LADDER or HYDRAULIC DREDGE– which fits your need?

Yuba builds both... either may be used for sand and gravel production

Yuba Bucket Ladder Dredges are built to dig tough materials – cemented gravel, boulders, coral formations and bedrock without costly drilling and blasting. Dredging costs under 5c per ton are not uncommon. These dredges float in their own ponds, excavate without lowering surrounding water level. Bucket sizes range from 2½ to 18 cu. ft.... digging depths from 10 feet or less to 125 feet below water level.

Yuba Hydraulic Dredges are ideal for dredging sand and gravel from streams, lakes and waterfilled pits. They can be powered to cut sandstone and cemented gravel. Intake sizes from 6 inches.

On-board Processing Plant – Complete equipment for screening, washing and classifying can be mounted on board either type of dredge – bucket ladder or hydraulic. Dredge can be designed for stockpiling ashore; loading into barges, trucks or shore conveyor; or pumping ashore thru pipes.

Regardless of whether you need a bucket ladder or hydraulic dredge – consult Yuba. We can design and build a new one from scratch... or redesign, move, rebuild a used one. Wire, write or call us NOW. No obligation, of course.

Cutter head of Yuba-built Franciscan, largest, most powerful hydraulic dredge on West Coast, is built to handle difficult sandstone.

99

YUBA DREDGES — PROVEN DEPENDABILITY

YUBA MANUFACTURING CO.

Room 651, 351 California St., San Francisco 4, California, U. S. A.

AGENTS { SIME, DARBY & CO., LTD. · SINGAPORE, KUALA LUMPUR, PENANG. SHAW DARBY & CO., LTD., 14 & 19 LEADENHALL ST., LONDON, E. C. 3.

CABLES: YUBAMAN, SAN FRANCISCO · SHAWDARBCO, LONDON

Obituaries

JOHN BRAEN, retired president and treasurer of the Braen Sand and Gravel Company and of Samuel Braen & Sons Quarry, Totowa, N. J., died on January 24 of a heart attack in his home. He was 72 years old. He had retired from active participation in both firms in 1945.

WAYNE A. MCGOWAN, 54, vice-president and manager of the Ideal Sand and Gravel Company, Mason City, Iowa, died unexpectedly on December 14.

WATSON WESLEY FLETCHER, 61, traffic manager of the Dewey Portland Cement Company, Kansas City, Mo., died on December 4.

HARRY SMITH DAVISON, 74, secretary-treasurer of the J. K. Davison and Brother Sand and Gravel Company, died on December 13 in Pittsburgh, Pa., after a brief illness. Mr. Davison also was vice-president of the Kittanning Builders Supply Company.

WILLIAM H. WELDON, 77, former president of the Fanwood (N. J.) Stone Crushing and Quarry Co., the Wel-Done Concrete Corporation and the Somerset Trap Rock Corporation, died on December 21. At the time of his death Mr. Weldon was also president of the Weldon Contracting Company in Westfield, N. J., where he made his home.

ALBERT E. DOWNES, retired sales executive of the Lehigh Portland Cement Company, died on December 17 at the age of 72 years after a long illness.

WILLIAM SHALLCROSS SPEED, chairman of the board of the Louisville Cement Company, Louisville, Ky., died on December 8 at the age of 82. Mr. speed was a former trustee of the University of Louisville, which he endowed with $75,000 for the Speed Scientific School.

CORNELIUS M. MARTIN, 71, founder of the Escondido Sand and Gravel Company in Escondido, Calif., died on October 16, 1955. Mr. Martin began his quarrying business in 1911. He later took his sons, Edward L. and Robert C., as partners. He was active in the company's business until the time of his death.

Pit-and-Plant Housekeeping needs doing every day!

Your clean-up tasks pay no direct profits, but, if neglected, they can give you ore grading troubles, increase hauling costs, add to equipment-maintenance, and cause downtime that cuts production. One man and a modern motor-grader can do all these necessary "housekeeping" chores day-by-day . . . save expensive man-hours and production delays before the condition gets so bad it must be dealt with as an emergency involving costly repairs.

That is why we recommend the use of a modern Adams grader on a regular program of mine housekeeping. Here is a list of everyday assignments you probably include among your "housekeeping" problems:

1. **Haul-road maintenance . . .** saves tire-wear, speeds hauling, improves safety, keeps production rolling, cuts costs, increases profit.

2. **Clean-up of pit floors . . .** permits driving equipment by shortest route, saves wear on tires and crawlers, improves pit drainage, keeps dirt and refuse from weathering into lower levels of ore.

3. **Clean-up after blast . . .** the sooner scattered fragments from blast are moved back against toe, the safer for men, tires, and machines that move around your pit.

4. **Clean ore-benches of washed-down dirt . . .** the better your grade of ore, the better your price. Leaving silica and other washed-in debris on your benches invites it to wash into cracks, crevices, and drill holes in your ore. Prompt grader-service stops further "wash", piles the material for easy removal by scraper or truck.

5. **Keep concentrating-plant area clean . . .** safe to work around . . . drive around. There is occasional spill over the sides of heaped trucks, around conveyors, grizzlies, hoppers, trestles, and it pays to clean it up . . . daily. Keep roads, runways, and working areas around the plant neat, clean, and workable.

6. **Keep toes of stockpiles pushed in . . .** they contain valuable merchandise. Weather and loading operations tend to spread your stockpiles, eat up valuable workspace, waste stored material. To load from this thinly spread toe gives inferior grades, increases loading cost. A few minutes work with a motor-grader once or twice a week keeps your stockpiles clean, gives more work-room.

7. **Keep drainage open . . .** don't let puddles stand. Your pit area continually needs new drainage ditches. As old ditches fill, you need to clean them out. The best answer to ditch problems is the modern motor-grader. Watch an Adams grader work . . . you'll quickly see why a few hours a week with an Adams will keep your ditches clean and your pit dry.

8. **Level and spread on dumps . . .** means that trucks drive faster coming on . . . and faster off . . . safer, too. Adams spreads material clear over the edge with offset blade that reaches far out beyond leaning wheels that hold against side thrust. An Adams travels up to 25 mph . . . doesn't take long to get up on the dump, clean-up, and get back to the pit, working the haul-road both ways.

9. **In winter,** blade-grading of snow and ice quickly cleans pit and plant roads for safe, fast hauling. If there are drifts to lick, a V-plow attachment on your Adams grader helps open blocked roads quickly.

10. **For exploration teams,** a modern motor-grader to maintain haul-roads is a "must". Once heavy clearing is out-of-the-way, an Adams heavy-duty grader can build you a mile of well-graded-and-drained highway in a matter of hours.

It may be a good idea now to check your pit and plant housekeeping. Check, too, your available graders . . . compare them with the work-ability and versatility of a modern Adams. Perhaps it's time for a change? A new broom sweeps clean . . . a new Adams could revitalize your housekeeping program! Write for further information. And if you'd like reprints of this advertisement to use in discussing "housekeeping" with your staff, just tell us how many copies you need.

A size ADAMS for every need

Model 660—150 hp diesel engine, 27,730 lbs.
Model 550—123 hp diesel engine, 23,500 lbs.
Model 440—104 hp diesel engine, 21,500 lbs.
Model 330— 80 hp diesel engine, 20,500 lbs.

Adams optional equipment includes dozer blades, scarifier, snow plow, and snow wing.

Good haul roads speed hauling, save tire wear and truck maintenance, improve safety. Adams graders do this work fast, at low cost.

AG-6-M-b

LeTourneau-WESTINGHOUSE Company
Peoria, Illinois
A Subsidiary of Westinghouse Air Brake Company

Legal Decisions

By LEO T. PARKER
Attorney at Law
Cincinnati, Ohio

Legal Effect of Unrecorded Deed

A reader recently asked this question: "Our company signed a lease contract with the holder of a recorded deed to excavate sand, gravel, etc., from the land described in the deed. Now we find, after paying this person the agreed price for the sand and gravel which we removed from the land, that a person named Alison has had for many years an unrecorded deed for this land. Alison threatens to sue our company for the value of the materials removed from the land. What are our legal rights?"

According to a late and leading higher court, a land owner who fails to record his deed, cannot recover damages from a person or company which innocently takes materials from the land.

For example, in *Hosier v. Great Corporation,* 57 Atl. (2d) 38, it was shown that one Hosier sued the Great Corporation for $25,000 damages, claiming that this corporation had excavated sand, stone, soil, and gravel from his land without proper and legal permission.

During the trial the testimony showed that Hosier actually held a deed to the land on which the corporation had excavated. However, the deed was not recorded.

In holding the Great Corporation not liable to Hosier for any payment, the higher court said that taking the sand and gravel from the land whose deed was unrecorded by its owner did not constitute any legal wrong by an innocent person or corporation whose officials had no knowledge that Hosier owned the land.

This court went on to explain that the corporation would have been liable to Hosier if the testimony had shown that the corporation's officials had knowledge that Hosier held an unrecorded mortgage for the land from which the sand and gravel was taken.

Damages Allowable to a Contractor

Another reader wrote as follows: "At different times in the past I have read . . . that a contractor can sue a property owner and get fair compensation for defective work. Recently I took a contract from a property owner to furnish materials and labor to remodel a dwelling. Certain chimneys and fireplaces which I remodeled smoked. The property owner had another contractor rebuild the chimneys and fireplaces. What payment can I get from this property owner?"

According to a recent higher court this contractor can recover the original contract price less the cost to the property owner of having the chimneys and fireplaces rebuilt, or repaired.

For illustration, in *Alexandria Marble & Granite Works, v. Hard,* 35 So. (2d) 673, these facts were proved: A property owner named Hard approached officials of the Alexandria Marble Works and asked if the company could supply a marble mantelpiece. A contract was made for the mantelpiece and also the installation at a stated price. The company prepared the marble and took it out to Hard's house, but found that the fireplace was a 24-in. brick fireplace, while the mantel was prepared for a 34-in. fireplace. It was decided between Hard and the company's officials to remodel the fireplace to fit the new marble mantel. This was done by the company's employees. It was understood that Hard would pay additional for this remodeling work. When the work was completed, Hard refused to pay the agreed contract price because at the time the fire chief had inspected the fireplace, he stated that the installation constituted a fire hazard. Other experienced fireplace workers agreed with the fire chief.

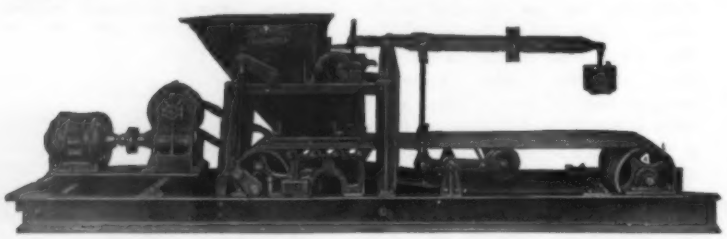
In subsequent litigation the higher court held that Hard must pay to the company the original contract price for the mantelpiece, but need not pay for the installation and remodeling.

This court said:

"The measure of damage suffered by an owner for defective or unsuitable materials furnished is the cost of doing the work with proper materials."

This court also explained that if

1 MACHINE handles all Scaling Jobs
. . . the Versatile
SCHAFFER POIDOMETER
Weighs • Blends
Proportions • Feeds
Records • Mixes



OVER 1400
now serving Industry

•

Write for
Catalog No. 5

This outstanding unit provides all the right *weight* answers to processors and handlers of bulk materials.

Poidometers perform automatically, accurately and at high speed . . . they're also durable, easily operated, and show large working and maintenance economies. Available with remote control weighing and recording devices, and total weight recorders.

SCHAFFER POIDOMETER CO. • 2828 Smallman Ave. • Pittsburgh 22, Pa.

a NEW screen...for NEW profits

in specification aggregates

Here's New proof you get MORE...MORE VALUE when you specify A-C! Every feature of the new Model "S" screen has been carefully calculated to give you outstanding performance at lowest possible cost...

1. **Added screen cloth life** provided by close spacing of clamping bar bolts and by proper camber of deck.

2. **Rigid side plates** reinforced by vertical angles.

3. **Sturdy screen deck frame** features heavy channels, diagonal braces, replaceable cross members.

4. **No metal-to-metal contact.** Full-length rubber buffer strips cushion screen cloth.

5. **Screen surface easy to install** — Surface slides into place over full-length hook supports. Self-locating clamping bar assembly accommodates screen surface of any thickness.

6. **All parts replaceable.** All bolted construction, using locknuts.

7. **Feed box** (optional) absorbs impact of incoming material. Provides uniform distribution when equipped with flow control gate.

8. **Back plate** (standard) **prevents spillage** — adds structural strength.

9. **Springs prevent whipping and breaking** of screen cloth by maintaining proper tension.

10. **Simplified mechanism** assures maintenance economy.

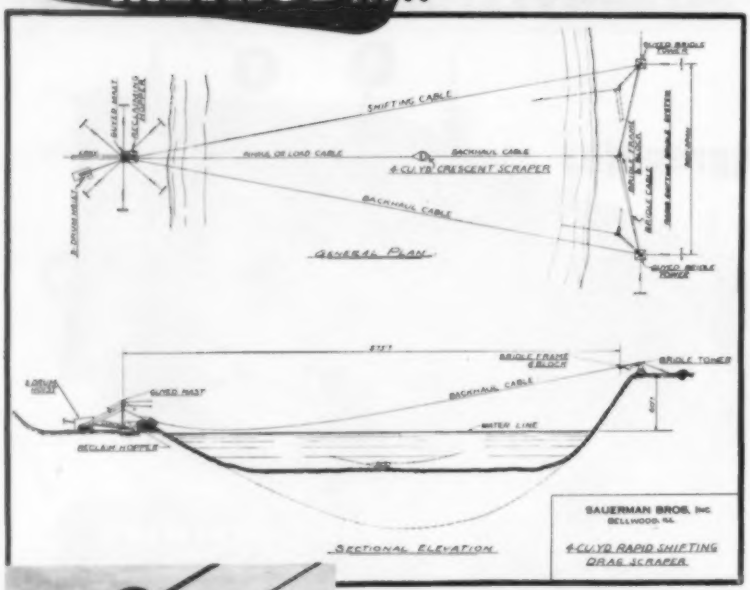
For complete information, see your A-C representative or write Allis-Chalmers, Industrial Equipment Division, Milwaukee 1, Wisconsin. Ask for Bulletin 07B8229.

ALLIS-CHALMERS

A-4975

the SAUERMAN METHOD.....

Scraper Machines Engineered to Your Operation



Above drawing was prepared for a specific drag scraper installation and does not represent maximum spans.

View shows rapid shifting bridle frame and all operating cables. Crescent may be seen in background conveying load to reclaiming hopper just in front of mast.

•

Contact Sauerman's engineering department for specific recommendations and information. No obligation.

Ask for Catalog A, Drag Scrapers—24 pages of job photos and specifications. Request Field Reports showing your material being handled by the low cost Sauerman Method.

The Sauerman Method works equally well over widely differing areas and span limits . . . on hills, swampy ground or underwater . . . handles any material a dragline can dig.

Every scraper machine is powered by a Sauerman Roller Bearing Hoist, especially designed to withstand sudden shocks and changes in speed.

When a rapid shifter is used, a third hoist drum is added to shift the bridle frame. The rapid-shifting bridle system (upper right of drawing) permits frequent shifting of the scraper's line of operation in non-caving material, shallow excavations or overburden.

Operating costs are lower—basically, it is cheaper to drag material than it is to lift and transport it. You eliminate the power costs of moving heavy machinery about the area. You pay only for pay loads—not dead weight. When expendable parts—sheaves, clutch or brake linings—are replaced, the machine is restored to practically new condition.

Sauerman can help you select the method of materials handling most profitable for your job—a system that will give you the lowest cost per cu. yd. handled.

SAUERMAN BROS. INC.

634 S. 28th AVE. | BELLWOOD, ILL.

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a contractor fails to complete a job according to plans and specifications, the property owner may have the contractor's defective work repaired or completely done over by another contractor and deduct this cost from the original contract price. The court added that under no circumstances may a property owner withhold payment of the full contract price from a contractor who breached his expressed or implied contract.

Contract Not Specific

Recently this question was asked: "What is the law with respect to injuries to employees while going from one job to another job?"

Generally speaking, an ordinary employee cannot recover damages or compensation for an injury sustained while going from one job to another. However, an employee can recover for injuries received while going from his home to his employer's place of business, or from one job to another job, if he received pay while performing these duties.

For instance, in *Hohman v. Soffel Rock Company*, 46 Atl. (2d) 475, it was shown that a foreman had no regular place of work but went from one job to another, as directed by his employer. He used his own automobile, for which he was reimbursed by the employer, and he was paid wages from the time he left his home.

One day the foreman started from his home in his automobile, hauling with him materials which he had taken to his home to complete a job that day. On his way to the job the foreman was killed in an automobile accident.

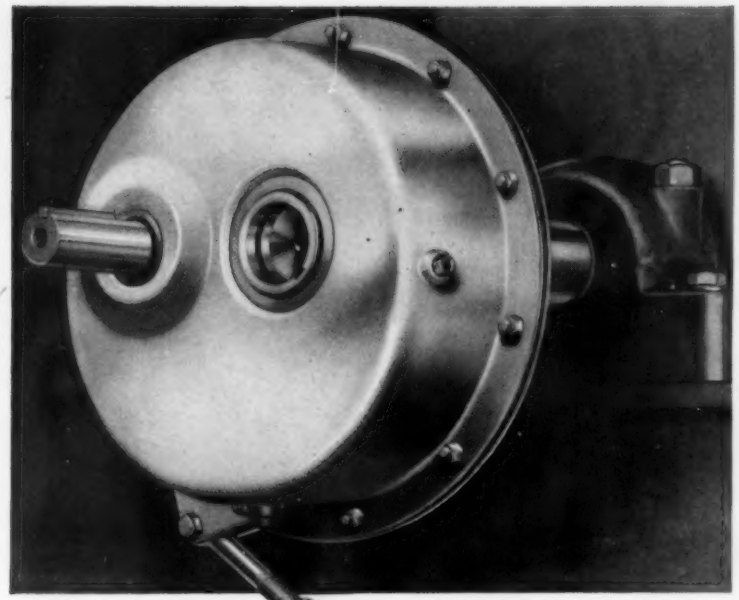
The employer refused to pay compensation to the employee's dependents on the contention that the injury was not sustained "within the scope of the employement".

It is interesting to observe that the higher court awarded compensation, saying:

"The service of the employer's interest in the circumstances shown necessarily made of the claimant a 'roving' or 'itinerant' workman. The claimant's travel, for which he was reimbursed by his employer, was an essential part of the expeditious performance of his work in the furtherance of the employer's business, as was also his transportation of the supplies which were stored at his home for his use in his work."

Within Scope of Employment

Hence, it is well established law that an employee injured while acting "within the scope of his employment" may receive compensation under the State Workmen's Com-



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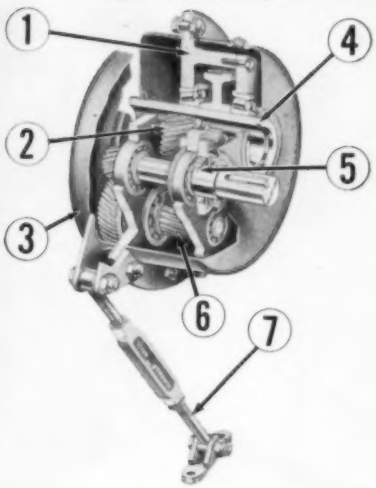

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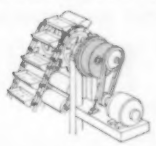

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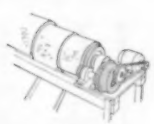

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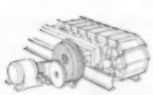
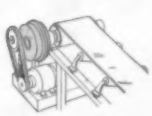


APRON FEEDER



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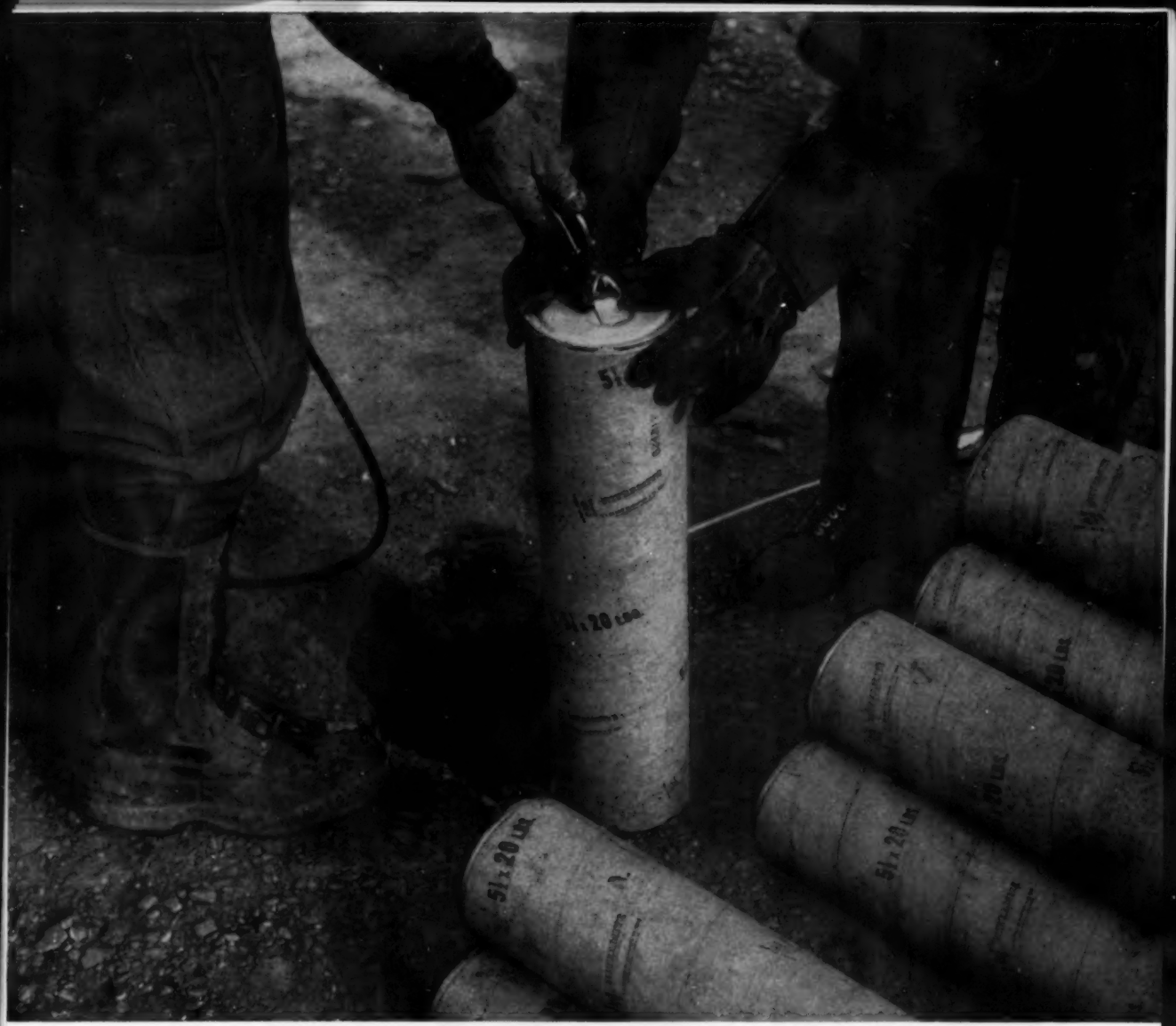

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pensation Act. Generally speaking, however, an employee injured in a fight, not connected with his regular work, cannot recover compensation. Nevertheless, if he was injured while doing his regular work, he is "within the scope of the employment" and can recover compensation.

For instance, in *Kenny v. Esslinger*, 55 At. (2d) 554, it was shown that a man named Kenny was employed as a truck maintenance man in his employer's garage. One day Kenny "kidded" a foreman named Burgoon about the number of employees Burgoon permitted to drink beer. In about five minutes Kenny returned to the garage to put some tools on a bench where he was working and he was struck by Burgoon. Kenny fell to the floor and sustained severe injuries. He sued to recover compensation under the State Workmen's Compensation Act. In allowing compensation the higher court said:

"The accident occurred after the altercation as claimant (Kenny) was walking across the garage floor to put some tools on the bench."

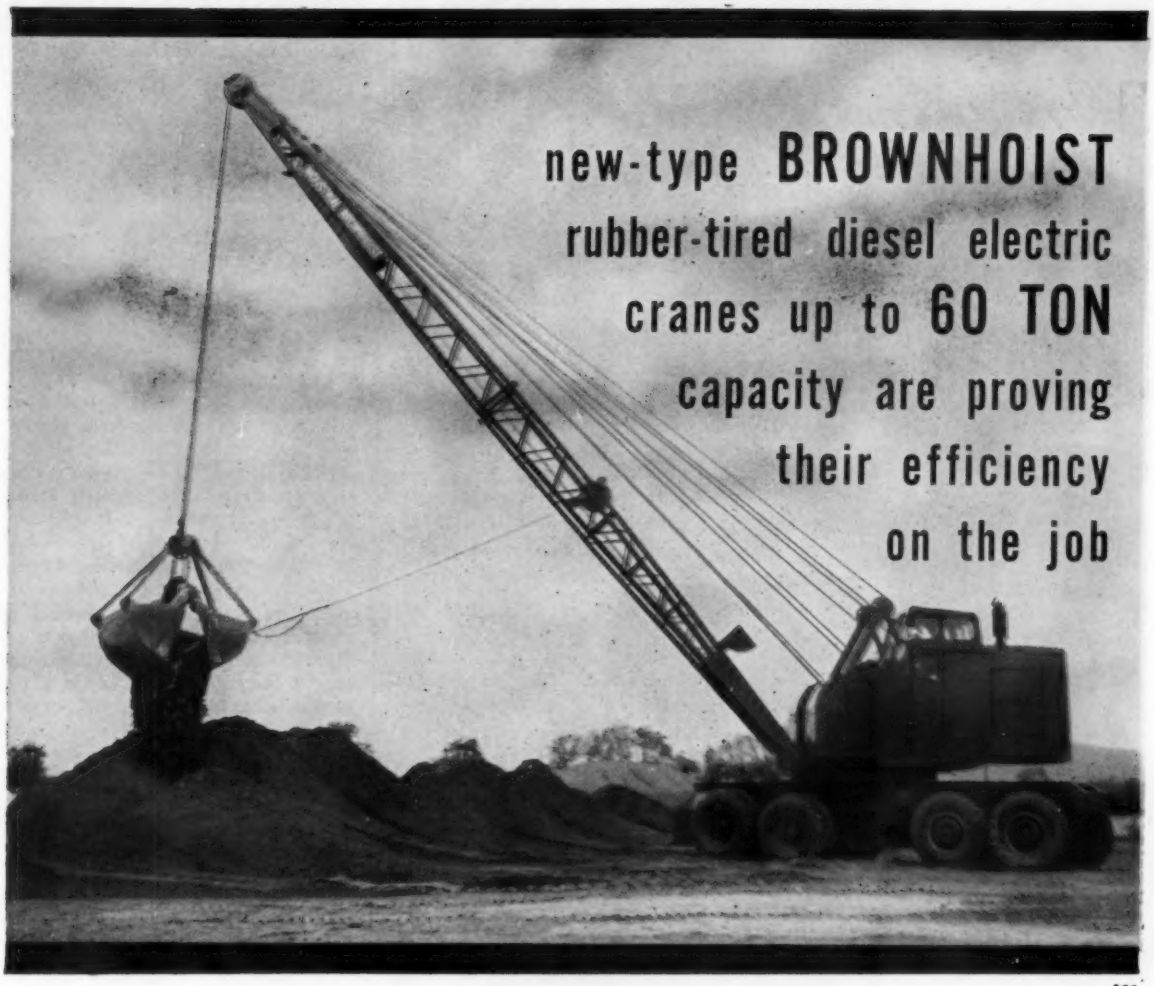
Hence, this court held that since Kenny was injured while taking tools to his bench, he was performing work "within the scope of his employment" when he was struck and injured by the foreman.

Must Use Care

One reader asked this question: "At times in the past I have read that an employer cannot be liable for damages to an injured employee unless the injury was caused by the carelessness of the employer. Suppose the employee was careless. Is the employer still liable?"

The answer is no, generally. While an injured employee can receive payment of compensation under the State Workmen's Compensation Act for all injuries sustained with the scope of his employment, this is not the law when the employee sues his employer for damages. An employer is liable in damages for an injury to an employee only when the testimony indicates that the employer's failure to supply a safe working place or safe appliances, or other negligence, resulted in the injury. Moreover, the employer is not liable if the danger was apparent to the employee, whose own negligence resulted in his injury. This same law is applicable in damage suits involving defective premises.

For example, in *Cary v. Streeter & Sons Company*, 169 N. E. 782, it was disclosed that an employer supplied an employee with a shovel to shovel gravel which was being



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unloaded from motortrucks and being dumped into an excavation.

One day as the truck was being unloaded, the employee slipped, dropped the shovel and fell, sustaining severe injuries. He sued the truck owner for damages, contending that the latter was negligent in not supplying a platform upon which to stand when shoveling the gravel as it was being unloaded.

However, the higher court held the employee not entitled to damages, and said:

"There was no evidence that the truck was defective or unsuitable for the purpose for which it was used or that it was operated negligently. Nor could it have been found that the defendant (truck owner) was negligent in failing to furnish planks or loading platforms. . . It does not appear that it was not reasonably safe to shovel the material dumped from the trucks without the use of planks or loading platforms. . . The plaintiff (injured employee) was an experienced shoveler. It does not appear that the dangers of the place in which he was set to work or the nature of the material in the load in question was not open and obvious to his inspection or that there was any reason to suppose that he needed any warning thereof."

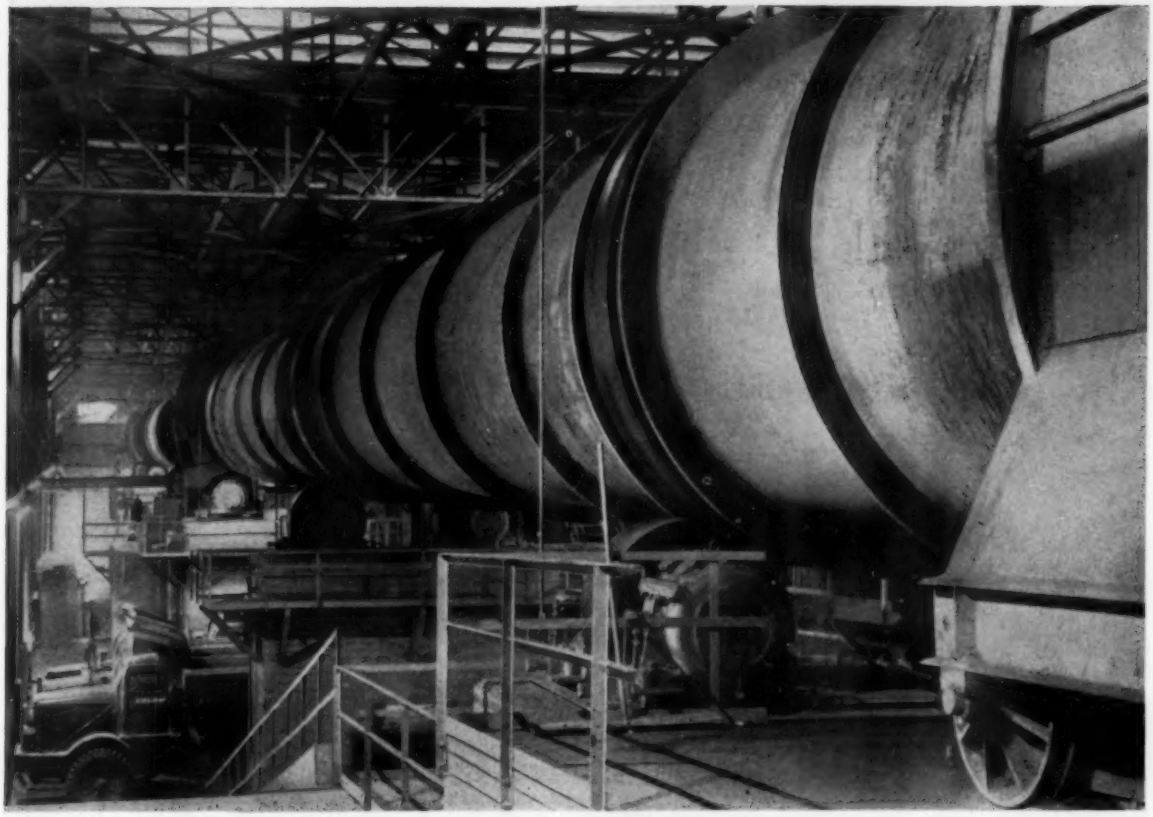
Defective Truck

The operator of a large quarry wrote, in part, as follows: "As you well know, the operation of a quarry calls for the use of many motor trucks which, due to the character of our work, are difficult to keep in good repair. Recently one of our drivers collided with an oncoming automobile because the truck's brakes did not take hold properly, as one of the brakes was wet. Can you cite a good case that may assist us to win the suit filed by the driver who was injured when our truck collided with his automobile?"

According to a recent high court decision, the driver whose negligence was the proximate cause of the collision is solely liable. Hence, you may win the suit by proving that the negligence of this injured driver caused the collision.

For example, in *Southwestern v. Wafer,* 208 S. W. (2d) 614, the testimony showed that the driver of a bus stopped the vehicle after dark near a bridge. The driver of a truck loaded with lime, approaching from the rear suddenly, applied his brakes, which were not properly adjusted. He pulled the truck into a head-on collision with an approaching automobile. In other words, due to the defective brakes on the truck, the

Profitable trends in the use of refractories



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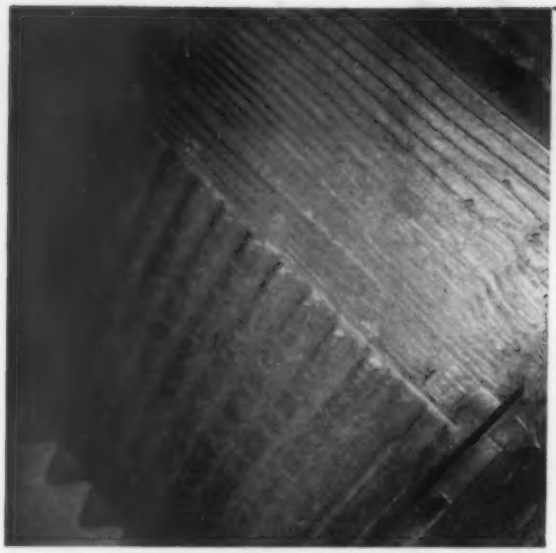

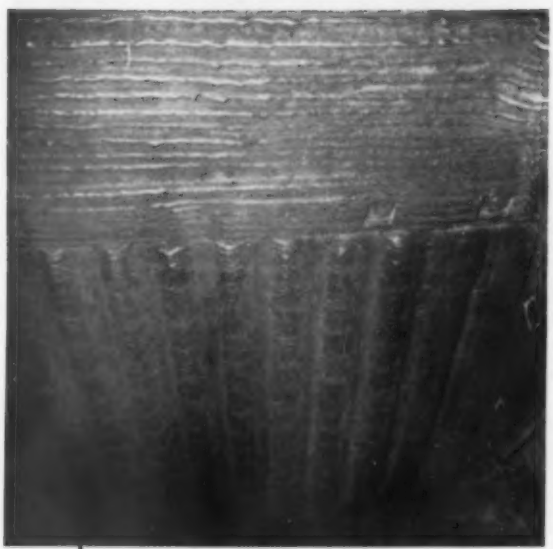

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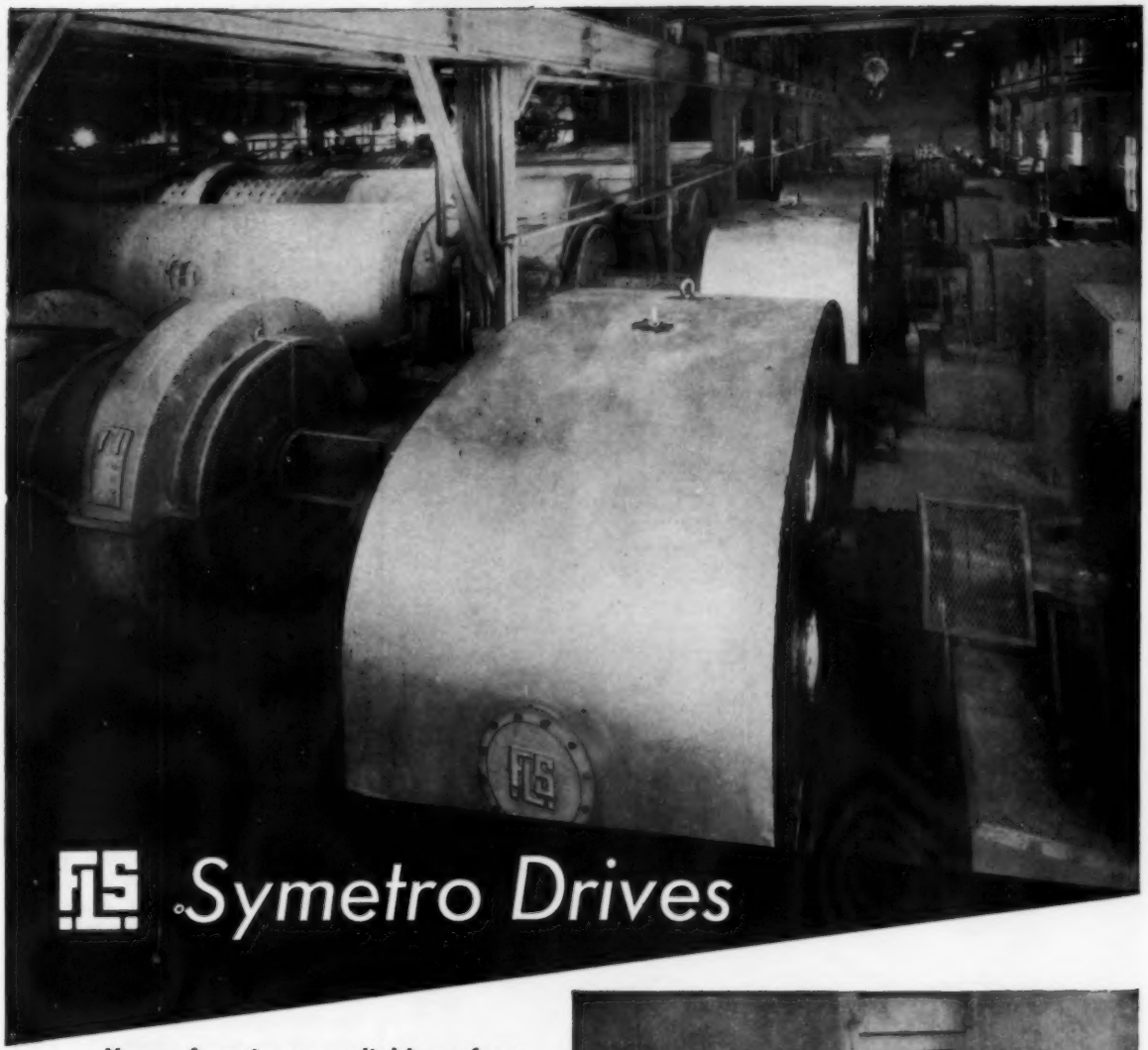

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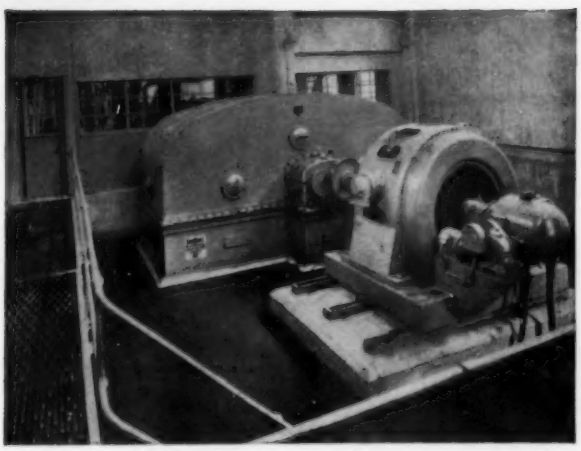
Over 7500 HP transmitted through Symetro gears direct to trunnions of raw mills in Canadian cement plant illustrated above.

Driving station for large clinker mill showing motor and Symetro gear in separate enclosure (right).



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latter collided head-on with an approaching car, whose occupants were seriously injured.

In subsequent litigation the higher court held the bus company solely liable in damages to the injured persons on the theory that the bus driver's negligence in suddenly stopping the bus without giving any warning signal to the truck driver was the proximate cause of the collision. This court said:

"The fact that Summers (truck driver) was guilty of negligence in driving the truck with defective brakes does not conclusively establish that the bus company was not guilty of negligence or that its negligence was not a proximate cause of the damage."

Garageman Liable

Here is a question asked by a reader: "If a serviceman fails to repair a motor truck properly, can he be held liable if the driver has an accident due to the defective repairs?"

According to a late higher court decision, if a serviceman or garage employee carelessly or negligently repairs a motor truck, the garage owner is liable in damages for injuries subsequently caused by the defective repairs.

For illustration, in *Moody v. Martin Motor Company,* 46 E. E. (2d) 197, the testimony showed that a motor truck was badly in need of repairs to the steering gear. The driver of the truck took it to a serviceman to be repaired. After the repairs were made, the driver was seriously injured when the drag link became separated from the steering arm on the truck, causing the truck to swerve off the highway and plunge down an embankment. The injured driver sued the serviceman for damages, alleging that his employee's negligence in failing to repair the steering apparatus properly caused his injuries.

The lower court refused to hold the motor company liable, but the higher court reversed the verdict.

Also, see Law of Torts, Vol. II p. 1039, 368, where it is stated that any person who repairs or lends an automobile and who fails to disclose a defect is subject to liability to any one who drives the vehicle.

Should Be Written

Some time ago I received a letter from a cement contractor asking why it is necessary to go to the trouble of making written contracts.

A few weeks ago a higher court rendered a decision which illustrates a reason why all contractors should be certain that written contracts are

Are you looking for a really good primary plant?

here's what Mr. Butler says:

" I like the way our Lippmann portable plant operates day after day to turn out the production I need. The 30x42 jaw crusher on this plant is the rock-eatingest crusher I have ever used. I get 250 yd.per hr. of 4" minus stone from it and with the amount of crushing necessary, that's real production."

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LIPPMANN portable primary crushing plants are available in sizes up to 30 x 42 (jaw crusher size) and with gasoline, diesel or electric power. For full information see your local Lippmann dealer or write the factory. Lippmann Engineering Works, 4607 W. Mitchell St., Milwaukee 13, Wis.

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24 x 36 Grizzly-King crushing plant and Lippmann stacking conveyor in an Illinois pit.

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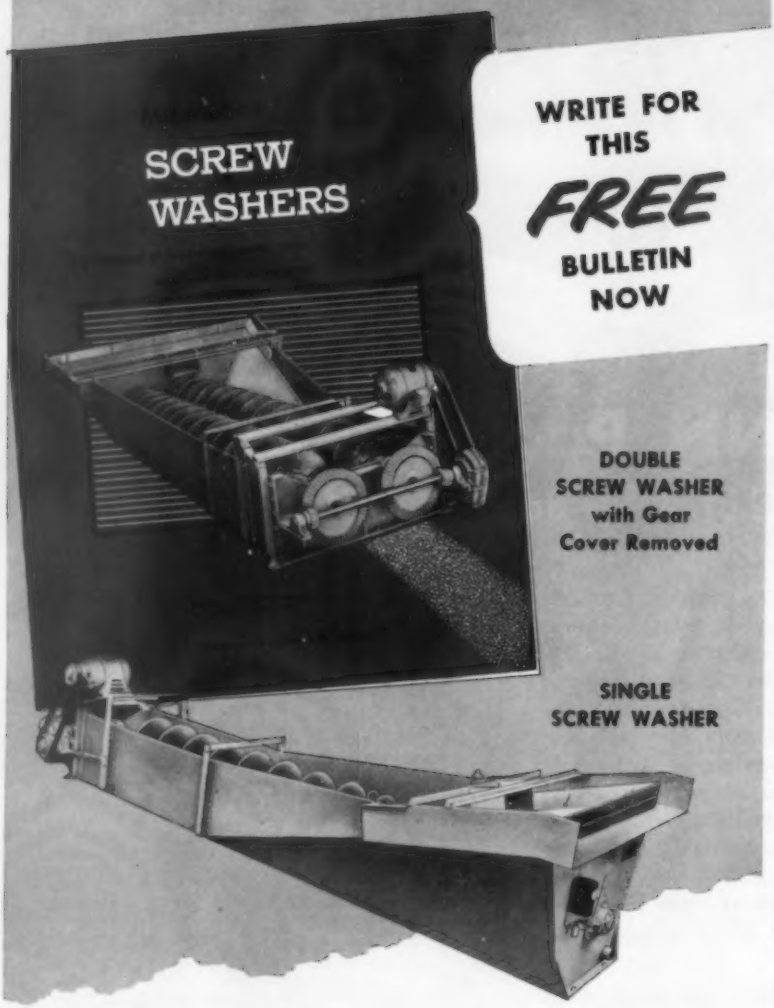
How to Dewater, Classify and Remove Waste from Sand, Limestone and Similar Materials*



*Here's a new bulletin you should have—on cleaning, dewatering, classifying sand and other coarse or fine materials—with McLanahan Single or Double Screw Washers. Complete details on models, capacities, screw sizes, etc., available. Write for your copy today!

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clear and unambiguous. Such a foresight may save the contractor many thousands of dollars.

For example, in *Standard Construction Company v. National Tea Company,* 62 N. W. (2d) 201, the testimony showed facts, as follows: A contractor entered into a written contract to construct a warehouse building. The plans and specifications provided that the contractor "prepare for paving where shown."

During the construction work the contractor found it necessary to supply and compact a considerable amount of crushed rock to provide a suitable foundation or base on filled ground not shown in the plans, to support the concrete floor. The contractor sued the building owner to recover "extra" payment for this work and for materials.

The building owner contended that any experienced contractor should have realized that fresh fill would require rock compaction where it served to support the concrete floor of the building.

Nevertheless, the higher court ordered the building owner to pay the contractor the amount of $10,876.33, plus $10,000 attorney's fees. The court said:

"A man may contract to do what is impossible, as well as what is difficult, and be liable for failure to perform. The important question is whether an unanticipated circumstance has made performance of the promise vitally different from what should reasonably have been within the contemplation of both parties when they entered into the contract. If so, the risk should not fairly be thrown upon the promisor."

Blasting Liability

A reader asked this question: "I am interested in law on blasting. Just what does a property owner have to prove in order to get damages from a quarry owner for damages to buildings on his property? Also, what can the quarry owner prove to win the suit?"

The leading higher court decision on this subject of law is *Erie Railroad Company v. Tompkins,* 304 U. S. 64. In this case the Supreme Court of the United States laid down this law: A corporation conducting blasting operations on his own land is liable to an adjoining or neighboring land owner for any injury resulting from casting rocks or other debris on such adjoining land, regardless of any prudence or negligence in the mode or circumstances of the blasting. But, as to any injury as may result from one's lawful operations on his own premises,

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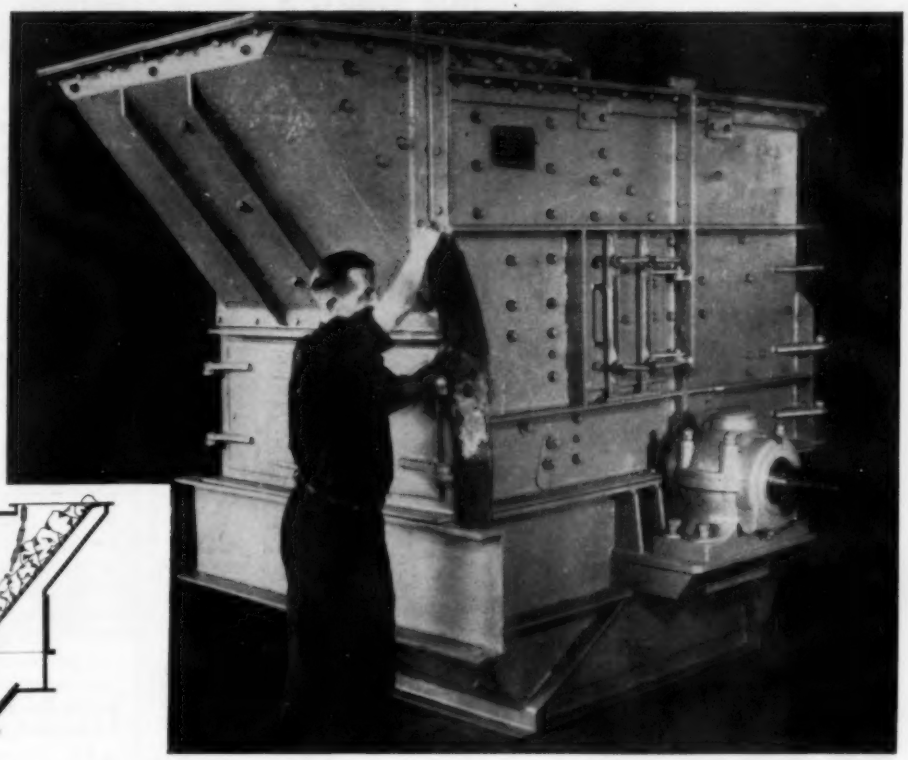
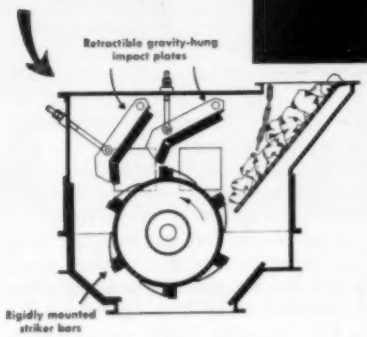
HAZEMAG IMPACT CRUSHERS *operate on this principle*





Hazemag Impact Crushers are available in three types, each in a wide range of capacities:

The **"BLOCKBUSTER":** A primary crusher of large capacity and extremely heavy construction; with a reduction ratio so great that many materials — cement rock, gypsum, etc. — can be "double-staged", i.e. crushed from shovel size to ball mill feed in one pass, eliminating the secondary crusher.

The **"RANGEMASTER":** A wide-range secondary crusher with the special Hazemag "controlled fineness" feature. Close regulation of product size is possible by adjustment of blade speed and clearance: from the characteristic high fines of an impact crusher to the uniform small size and low fines now in increasing demand for heavy media separation, road aggregates, etc.

The **"HISPEED":** A fine-crushing impact machine, operating at very high tip speeds. May be used as a tertiary. Ideal for fiberizing and all crushing applications where impact is low and fine sizing is required.

HAZEMAG

HAZEMAG IMPACT CRUSHERS

SALES AND ENGINEERING OFFICES THROUGHOUT THE WORLD

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Hazemag (Canada) Ltd.
1170 Drummond Street
Montreal P.Q.

IN THE U. S.
Richard E. Kleinhans
International Industrial Sales
122 East 42nd Street
New York 17, New York

IN MEXICO
Diesel Mexicana, S. A.
Reforma 20, Desp. 102,
Mexico D.F. City

Munster (Westf.) Germany

Remove 4 Bolts and there's the impeller! . . . no need to disconnect piping

MORRIS

TYPE RX

Slurry Pump

Morris Type RX is the slurry pump whose impeller can be removed without disturbing the suction and discharge piping or the bearings! To get at the impeller and renewable shaft sleeve, you simply loosen four outside clamping bolts—slip them out of disc slots—take off the end cover. Impeller unscrews from shaft threads; shaft sleeve is removed through end cover opening.

At no point do you have to dismantle the piping. Lay-up time costs are less . . . pump is back in service quicker.

Write for specifications, capacities, performance charts, and other helpful information. Ask for Bulletin 185.

Use the Morris Type RX in Your Mining Operations

Morris Type RX is the product of nearly a century of experience in designing and building materials-handling pumps. It is specifically engineered to handle mixtures containing ore concentrates . . . tailings, slag and residue from filters and classifiers . . . all types of caustic or acid mixtures containing abrasives or solids.

MORRIS CENTRIFUGAL PUMPS

MORRIS MACHINE WORKS
Baldwinsville, N. Y.
Branch Offices in Principal Cities

not constituting a legal nuisance, there is no liability to an adjoining or neighboring land owner except for some proximate negligence in the mode of such operation.

Also, a few weeks ago a higher court upheld this law. For illustration, in *Republic Corporation v. Peoples,* 217 Fed. (2d) 236, the testimony showed facts, as follows: Certain property owners sued a corporation for heavy damages to dwellings allegedly caused by dynamite and blasting of rock and ore formations. During the trial the corporation offered its daily records, showing the amount of explosives and the number of shots fired during the period in question and through its foreman and others outlined the practices and procedures used in drilling, loading, and firing the various shots. In short, the corporation revealed the full extent of its blasting operations and disclosed that when the heavier shots in the overburden were to be made, technical advice was sought and obtained. A technical expert of the DuPont Company testified that on request he gave such technical advice and assistance. He stated further that in his opinion the corporation's blasting practices, as revealed by the Company's records and from his own observation, were in accordance with generally accepted blasting practices; that the loadings were not excessive but if anything, were light and the shots were insufficient to cause damage to the dwellings.

On the other hand, the property owners argued that the dwellings were undamaged before the blasting took place and evidence that the damage appeared after the blasting occurred would naturally support the inference that the damaged condition in the structures was due to the negligent blasting. The higher court refused to hold the corporation liable in damages to the dwelling owners and said:

"We cannot follow this reasoning, which at best is not legalistic. The burden is on the plaintiffs (dwelling owners) to show some specific act or acts of negligence, and to show further that such negligence directly contributed to the result. Mere proof that the residential structures were damaged by blasting would not alone sustain the actions. It must further appear that the defendant company in using explosives, violated a duty owing by it to the plaintiffs in respect to their property or failed to exercise due care. Wrong and damage must concur to create a cause of action."

high-powered pour...

PHOTO COURTESY BLAW-KNOX COMPANY, PITTSBURGH, PA.

Chrysler Ind. 30 Engine powers mixer, gýrol Fluid Coupling doubles its life

Going up . . . one apartment house, fourteen floors high, in Cleveland, Ohio. The transit mixer is a Blaw-Knox. It is powered with a Chrysler Ind. 30 — 230 cubic inch displacement engine.

Most modern transit mixers are Chrysler-powered and equipped with Chrysler gýrol Fluid Coupling. And there is good reason for the popularity of this Chrysler combination.

In the first place, Chrysler Industrial Engines are heavy-duty, high-speed engines . . . constructed of heavy-duty components. Yet, thanks to Chrysler research in metallurgy, they are compact, lightweight engines, easily installed in modern equipment.

Secondly, gýrol Fluid Coupling — the other half of the Chrysler combination — absorbs the wear and tear imposed by power impulses, sudden starts and stops. The result is 100% *longer life for clutch, transmission and equipment itself.*

Finally, like other manufacturers of self-powered equipment, transit mixer manufacturers recognize the initial economy of installing Chrysler Industrial Engines. They know that Chrysler Industrial Engines are not expensive. Production-line methods adapted to specialized industrial engine building provide custom-built engines at mass-production prices.

Learn more about the advantages of Chrysler Industrial Power for your equipment. See a nearby Chrysler Industrial Engine Dealer or write direct: **Dept. 123, Industrial Engine Division, Chrysler Corporation, Trenton, Michigan.**

Chrysler Ind. 30 Engine — 230 cubic inch displacement

Chrysler

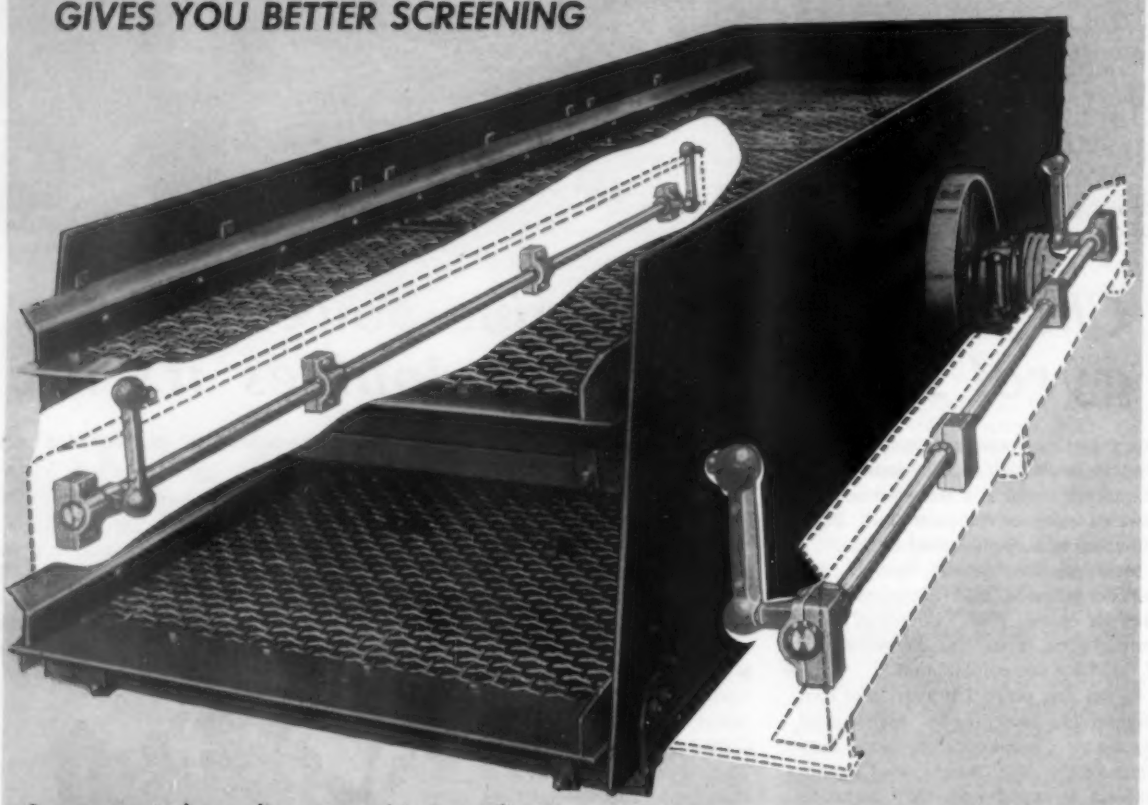
INDUSTRIAL ENGINES

Industrial Engine Division • Chrysler Corporation

Make 1956 Your "Look Ahead

SECO

SECO "LOOK AHEAD" ENGINEERING GIVES YOU BETTER SCREENING



Seco patented equalizer assembly in outline

OVER 350 MODELS IN SINGLE, DOUBLE, TRIPLE & 3½ DECKS

Year" with long-life

VIBRATING SCREENS

Here's Your Key to Years of high tonnages accurately screened at lowest cost per ton

(Above Seco Screens on-the-job at Cleveland Slag Co.)

This is a good time to "look ahead." Is your plant set up for really efficient screening when you start the new season? Or will your profit margin be reduced or lost because of low tonnages, excessive shutdowns, or other problems due to your present screens?

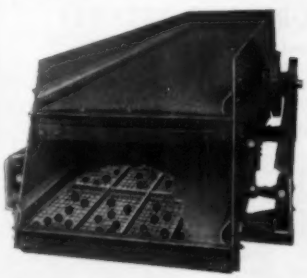
Look ahead! Get set now to profit on the immense new long term road building programs now getting under way. Consult Seco now and you will be ready, not only for accurate, trouble-free high tonnage screening this year . . . but for years and years ahead.

You don't have to take our word for it. Thousands of America's best operators agree "you can't beat Seco for performance."

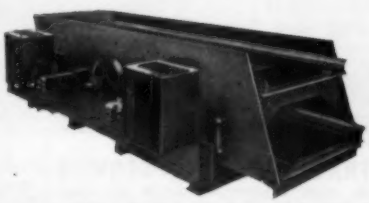
SEND FOR NEW SECO CATALOG No. 204

NOW! SCREEN MANY DAMP, STICKY MATERIALS

SECO BALL TRAY ATTACHMENT



SECO WITH ELECTRIC WIRE CLOTH HEATER



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TRUE CIRCULAR ACTION

VIBRATING SCREENS

SCREEN EQUIPMENT CO., INC.

Buffalo 25, New York

LEADERS SINCE 1883

IN EVERYTHING RELATING TO DIAMOND CORE DRILLING AND SOIL SAMPLING

FOR QUICK ACTION CALL DIAMOND 4-8507 AT SCRANTON

ORIENTED DIAMOND BITS
that Cut Faster — Last Longer

For either core drilling or any other type of diamond drilling, we believe these to be the most efficient and economical diamond bits ever produced and invite inquiries on that basis. Available at no advance in price in a wide variety of types and sizes to meet every diamond drilling requirement. Bulletin No. 320 illustrates all types and gives complete working data. Write for free copy and tell us about your drilling conditions. We welcome opportunities to make money-saving recommendations.

NEW LIGHT-WEIGHT HIGH SPEED CORE-DRILLING MACHINES

Model 30 and Model L-2

Supplementing our well-known heavy duty machines we now offer two light-weight high-speed core drilling machines suitable for either Skid, Trailer or Truck mounting. Both models can be powered either by gasoline or diesel engines and air or electric motors. Easily moved from one location to another, they can also be relied upon to produce good smooth cores rapidly at minimum expense. Complete information on request.

Model 30 Trailer Mounted

For easy portability without tying up a truck. Also complete truck-mounted units with 4-wheel drive.

ACCESSORY EQUIPMENT
STOCKED FOR PROMPT SHIPMENT

We manufacture a wide variety of accessory equipment for diamond drilling and soil sampling and carry all essential items in stock for prompt delivery. A NEW CATALOG, No. 400, not only illustrates and describes each item but also gives piece numbers and shipping weights. Write today for a free copy; it will help you to save time and money.

CONTRACT DRILLING SERVICE

For more than 70 years, Sprague & Henwood, Inc. has been a leader in the field of Contract Diamond Drilling and Soil Sampling. During this period our crews have completed thousands of contracts successfully, under every conceivable operating condition. Today, we have a large force of expert operators and an ample supply of modern equipment, so that we can undertake practically any job anywhere, on short notice. Inquiries for all types of contract drilling work are solicited — estimates submitted promptly.

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Manufacturers' News

Dean C. Smith has been elected vice-president of manufacturing at Thor Power Tool Company, Aurora, Illinois, and John A. McGuire, formerly vice-president in charge of labor relations has been elected to a full vice-presidency.

Mr. Smith has been serving as general manager of the company's Aurora works. Prior to his association with the Aurora firm he was president of his own company, Smith-Palmer Machine Corporation, Chicago, and he is a former vice-president of Olofsson Corp., Lansing, Mich., special machine manufacturers.

Dean C. Smith

John A. McGuire

Mr. McGuire joined Thor in 1939. He started in the accounting department and in 1940 was named manager of the accessories division. He became secretary of the company in 1943, and was elected to the board of directors in 1944. He was named chairman of the executive committee in 1952 succeeding his father, the late Dr. Walter G. McGuire. In 1953 he was promoted to vice-president in charge of labor relations.

J. W. Bloomquist, domestic sales manager of Euclid Division General Motors Corporation, Cleveland, Ohio, has announced the appointment of Tobin Tractor Company as authorized dealer for the Province of Saskatchewan, Canada. W. R. Tobin is president of the company with headquarters at 655 Albert Street in Regina, Saskatchewan.

Otto Joslin, Jr., has been named district sales representative by the Iowa Manufacturing Co., Cedar Rapids, Iowa. His territory will include Tennessee, Mississippi, Alabama, Georgia, South Carolina and North Carolina, with headquarters in Nashville, Tenn.

Eugene J. Kerr has been appointed manager—technical development of the Baltimore and Ohio Railroad, Baltimore, Md. He becomes the second appointment in the Research and Development Department, established this year, and will report to recently appointed vice-president Douglas C. Turnbull, Jr.

Mr. Kerr has served for the past ten and a half years as manager of technical services in the Coal Traffic Department of the B and O. His new duties will afford him the opportunity of studying the expanding uses of bituminous coal and of making comparisons with other forms of energy, including the nuclear fuels.

Worthington Corporation, New York, N. Y., has announced the election of Elston J. Tribble and Aloysius M. Tullo as vice-presidents. Mr. Tribble, former assistant vice-president—manufacturing, will have general supervision of a group of Worthington operating divisions which were recently organized. Mr. Tullo will continue as general manager of Worthington's division at Harrison, New Jersey.

After two years with the Colorado Fuel & Iron Company, Mr. Tribble joined Worthington in 1929. He was appointed production manager in 1935, assistant works manager of the Harrison Works in 1942, and works manager in 1945. He was appointed assistant vice-president in 1954.

Elston J. Tribble

Aloysius M. Tullo

Mr. Tullo joined Worthington in 1923 and was appointed manufacturing engineer in 1939. He was promoted to assistant works manager of the Harrison Works in 1945, manager of the Wellsville Works in 1951, and manager of the Harrison Works in 1954. He was appointed general manager of the Harrison Division in 1955.

How to beat a fleet of limited-duty rigs ...WITH ONE International® Drott 4-IN-1

Beat a power shovel wherever exclusive Drott *triple-power, prv-action break-out* is decisive—and where quick International crawler mobility can outspeed and "out-reach" a boom. Break-out force of the three Four-In-One models as Skid-Shovels ranges from 8,500 to 17,000 lbs!

Gain a 30-inch (or greater) dumping height advantage over ordinary roll-forward bucket dumping—by using the bottom-dump feature of the Four-In-One as a clamshell. And loading with the clamshell action, get a super-fast bucket-fill on stockpiled materials, even in cramped quarters.

Get versatile carry-type scraper action with the Four-In-One in Bullclam position. Using positive clam lip control, spread materials, strip, and grade with amazing accuracy. And as a Bullclam, the Four-In-One *heap-loads* itself with speedy, earth-boiling action!

Get big dozing capacity with finger-tip ease with your Four-In-One in bulldozer position. Regulate dozing depth by hydraulic "radius control" of blade pitch. Note the frost-breaking, earth-moving action. Shown here is new 2¼-yard Four-In-One for the International TD-14.

Prove Four-In-One versatility unlimited with the 1-yard TD-6, the 1½-yard TD-9, or the new 2¼-yard TD-14 model. Test *exclusive* pry-over-shoe break-out action, and *exclusive* shock-swallowing Hydro-Spring. Ask your International Drott distributor for a Four-In-One demonstration.

International Harvester Company, Chicago 1, Illinois

INTERNATIONAL® DROTT

What Do You Get In A BUCKET-?

BALANCED DIGGING POWER

•

PROPER SHELL DESIGN FOR CAPACITY LOADS

•

LOW CENTER OF GRAVITY

Plus

"A MOUTHFUL AT EVERY BITE"

IF it's an OWEN BUCKET

Yes, there are decided differences between OWEN clamshell buckets and clamshell buckets.

These differences originate in the engineering department, on the drawing board and culminate in actual superior bucket operation.

Make your own opinion-survey of "bucketwise" crane operators. You'll find the big majority of them will express a definite preference for OWEN buckets.

Write for the Catalog...

OWEN CLAMSHELL BUCKETS INSURE A BIGGER DAYS WORK

THE OWEN BUCKET CO.

5050 Breakwater Avenue • Cleveland, Ohio

BRANCHES: NEW YORK, PHILADELPHIA, CHICAGO, BERKELEY, CALIF., FORT LAUDERDALE, FLA.

The Fuller Company, Catasauqua, Pa., has acquired all of the outstanding stock of the Sutorbilt Corporation of Los Angeles, Calif.

The Sutorbilt Corporation has, for many years, been a manufacturer of positive pressure blowers, pneumatic conveyors, fans, material feeders, and related products. It operates two manufacturing plants in Los Angeles, a main plant, located at 2008 East Slauson Avenue, Los Angeles, and its main sales office and second plant at 6002 Walker Street, Maywood, in the metropolitan Los Angeles area.

Executive officers of Sutorbilt are R. S. Clark, vice-president; L. J. Erickson, secretary and treasurer; R. E. Schneider, sales manager; F. Thalen, chief engineer; and J. L. Verfurth, production manager. All these executives have been associated with Sutorbilt for many years. The Corporation will continue to operate as a separate company.

P. D. Shollar and J. F. Haley have been appointed departmental vice-presidents of Koppers Company, Inc., Pittsburgh, Pa.

Mr. Shollar, who is manager of the procurement department, has held that position since 1953. Before that he was assistant manager of the department for 16 years.

Mr. Haley, who has been manager of the traffic and transportation department for four years, is a native of Illinois. He was associated with the Illinois Central Railroad for 17 years, serving in various capacities before he was named office manager of the freight traffic department in Chicago. He joined Koppers in 1946 as supervisor of transportation, and in 1951 was named manager of the traffic and transportation department.

Union Bag & Paper Corporation, New York, N. Y., has announced the following territorial changes in its multiwall bag sales organization:

C. M. Campbell, former southeastern sales representative, will handle multiwall bag sales in Minnesota, North Dakota and South Dakota. He will headquarter in the company's Minneapolis office.

F. M. Whittaker transfers his headquarters from Minneapolis to the company's Chicago office. His new sales territory includes Iowa, western Illinois, and part of Chicago.

A. J. Sohmer, former midwestern sales representative, will handle multiwall bag sales in Delaware, Maryland, Virginia, and part of West Virginia. He will headquarter in the company's Baltimore office.

PLANNING FOR TODAY...
and tomorrow

The PEERLESS Cement Corporation has for years consistently followed a program of carefully studied plant modernization and new construction. With producing units strategically located to supply their markets, their goals have been: Higher ratio of output to dollars invested . . . lower unit costs . . . constant product improvement.

Throughout this period of growth, the Peerless organization has repeatedly called upon Giffels & Vallet, Inc. to furnish essential planning and engineering services. G & V's extensive experience in the cement and rock products field has also proved an important factor in helping other leading producers in the industry scale down costs and increase output.

A special Planning Brochure has been prepared by Giffels & Vallet, Inc. outlining the comprehensive planning and engineering services available. A copy will be mailed on request.

INDUSTRIAL ENGINEERING DIVISION

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DETROIT, MICHIGAN

NEW YORK
CHICAGO
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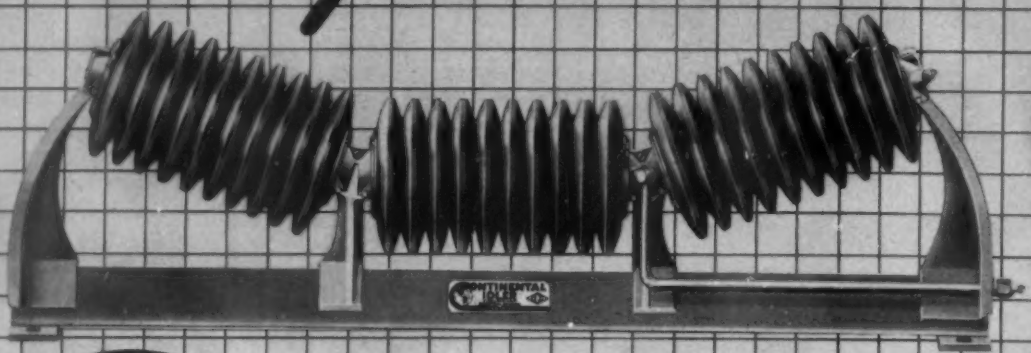
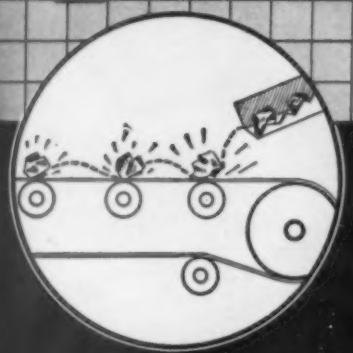
Engineers Serving Industry for Over Thirty Years

Save your Belts!





Use CONTINENTAL IMPACT IDLERS

Continental Impact Idlers under the loading point of your Conveyors will reduce damage to the belt covering and prevent breakdown of the carcass, thus lowering your belt cost per ton of material handled.

The design of Continental's Rubber Disc Impact Idlers has been proved superior by laboratory tests. The discs are mounted on a steel roll equipped with Timken Bearings and having the same sturdy construction as Continental's Standard Idlers so far as bearings, shaft size and grease seals are concerned.

Send us your orders and inquiries. Literature available on request.

CG-4901

INDUSTRIAL DIVISION

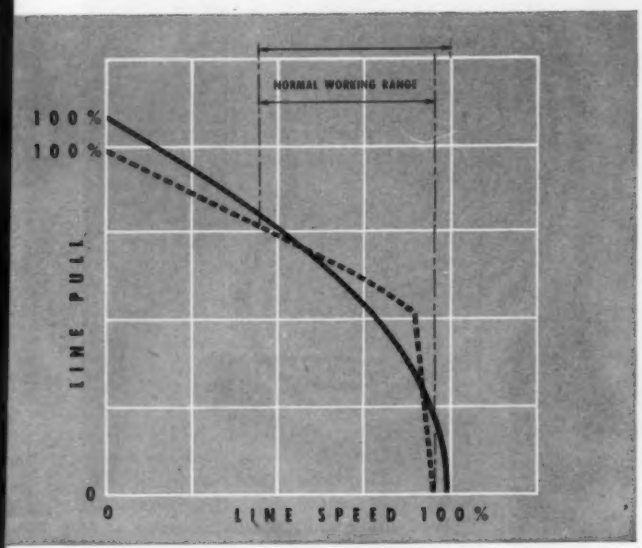
CONTINENTAL GIN COMPANY

BIRMINGHAM, ALABAMA

ENGINEERS CGC ATLANTA • DALLAS • KNOXVILLE • MEMPHIS CGC MANUFACTURERS

NEW YORK 17, NEW YORK

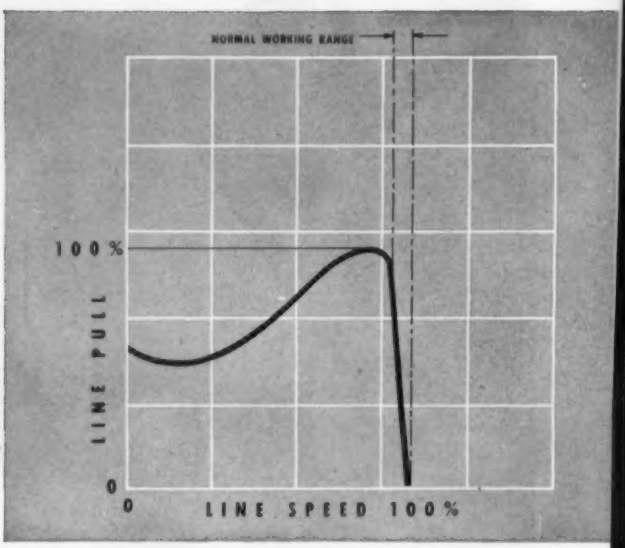
LIMA teams A.C. electric motor with torque converter for power-on-demand through wide operating range



Power Performance of LIMA'S New Optional Unit:

A.C. Electric motor with torque converter drive. [Diesel-torque converter curve (dotted line) shown for comparison.]

With this drive, even under extreme loading, the motor will pull down in speed only a very small amount. It can never be stalled. The line pull will constantly increase through a long pull down speed range, depending upon the load applied.



Power Performance of A.C. Electric Motor with Direct Drive:

The motor speed and torque vary as shown for line speed and pull

With a pull down in speed of only 3% to 5%, torque rises too fast The motor will stall quickly after peak torque is reached Workable speed range is small, stalls are frequent.

Lower First Cost — Reduced Maintenance

Now another quality-extra is available on all Lima machines. It's Lima's new electric power unit designed to give you full power-on-demand through a wide operating range.

Combining a single A.C. motor with a single stage torque converter, this drive matches, *electrically,* diesel-torque converter performance. It powers all motions and permits application of full power to any one motion as required. Under extreme loading, required power output is supplied at constant motor speed . . . and the motor can't stall or burn out.

The simplified electrical setup—with single A.C. motor and no complicated electrical controls—means lower first cost. Electrical maintenance is reduced to a minimum, and servicing does not require highly trained personnel.

Just check the performance curves above. You'll quickly see that Lima's quality-built electric power unit provides the ideal answer for *your* jobs calling for electrically powered machines. You'll get maximum power performance under all operating conditions. Get full details now from your nearby Lima distributor . . . or write Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

CAPACITIES

Shovels ½ yd. to 6 yds. Cranes to 110 tons. Draglines variable. Smaller capacities available on rubber.

Baldwin-Lima-Hamilton Corporation Construction Equipment Division also manufactures Austin-Western Crushing, Washing and Screening Plants at its Lima, Ohio plant . . . and Madsen Asphalt Mixing Plants and equipment at its La Mirada, California, plant.

BALDWIN BLH LIMA-HAMILTON

LIMA SHOVELS · CRANES DRAGLINES · PULLSHOVELS

BALDWIN-LIMA-HAMILTON

Construction Equipment Division · LIMA · OHIO · U. S. A.

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

MODERN, LOW COST HAULAGE EFFICIENCY

with MARION telescopic hoists and trailer dumps

Once you've experienced the all-around efficiencies of Marion Telescopic Hoists and Trailer Dumps, you won't settle for less. Check these features and benefits that make MARION a better buy.

- **Rugged, heavy-duty hoists with maximum lifting power. Built to last.**
- **Jacks made of heavy, seamless steel tubing and polished to controlled surface smoothness for reduced wear.**
- **Light weight. Compact.**
- **Design allows proper load distribution.**
- **Jacks are pin connected to frame so that side motion is allowed to prevent jacks from binding.**
- **Quiet operation.**
- **All welded bodies constructed to withstand sagging or twisting with uneven or extra heavy loads.**

Get all the job-proven facts and specifications from your nearby MARION distributor . . . or write direct today.

MARION BODIES AND HOISTS

MARION METAL PRODUCTS CO.
MARION, OHIO

John P. Grady has been named assistant general sales manager of the Chase Bag Company, Chicago, Ill. He will assist in the management of all functions related to the sale and promotion of Chase products, under the direction of W. N. Brock, vice-president and general sales manager.

Harrison B. Rue, manager of the Chase Bag Buffalo branch, has been named eastern regional sales director, replacing Mr. Grady. The Eastern region represents the territory and sales offices handled by the firm's Buffalo and Philadelphia branches, and its Richmond and New York City sales offices. Mr. Rue will continue to make his headquarters in Buffalo and serve as manager of that branch.

Louis E. Dierks has retired from active duty with Sauerman Bros., Inc., Bellwood, Ill., after 42 years of service. He was a vice-president and a member of the board of directors. His engineering ability coupled with his very practical nature contributed much to the development of Sauerman equipment.

Mr. Dierks is a life member of the American Society of Civil Engineers and the Chicago Engineers Club. His many trips to all parts of the North American continent and to Europe have made him a well known figure in the construction and sand and gravel fields. He will remain with Sauerman as a consultant.

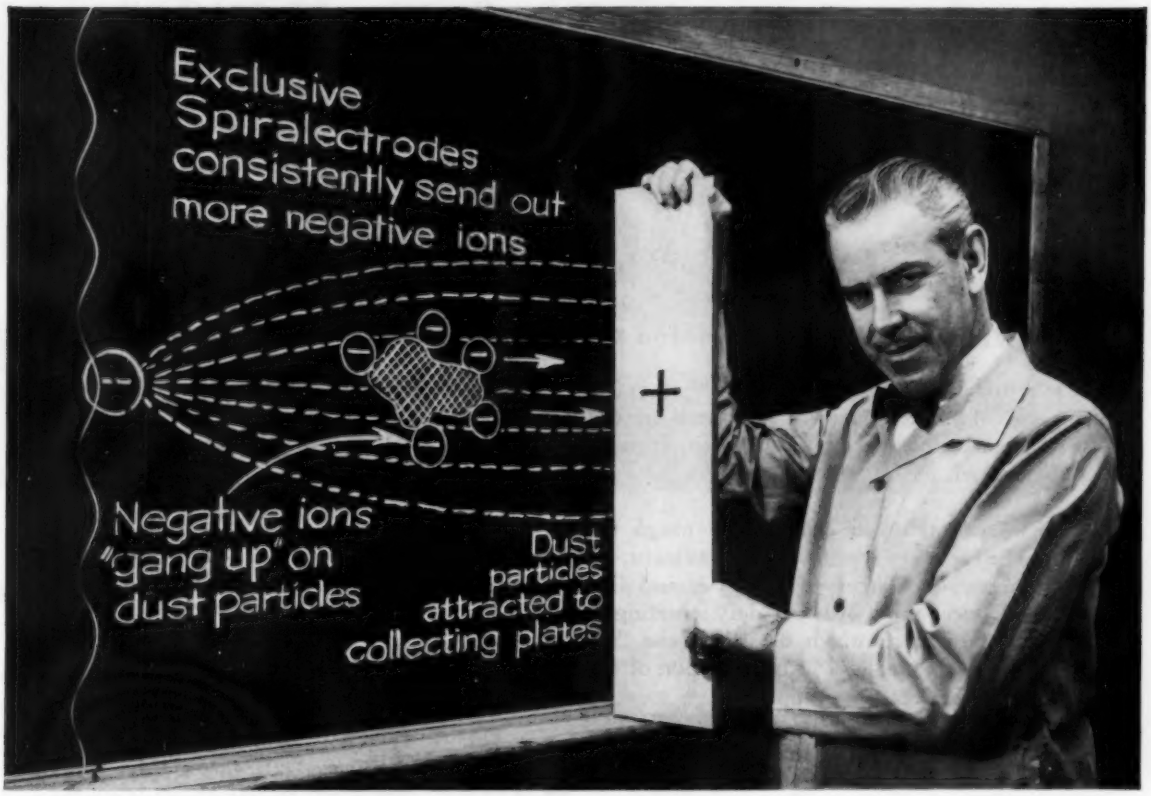
Robert J. Johnson has been named as a new district representative of Pioneer Engineering Works, Inc., Minneapolis, Minn., subsidiary of Poor & Company, Chicago, Ill. His territory will include New York, Connecticut, Rhode Island, Massachusetts, Vermont, New Hampshire, Maine, New Jersey, that part of Pennsylvania served by Service Supply Company of Philadelphia, and the Canadian provinces of Quebec, New Brunswick, and Nova Scotia.

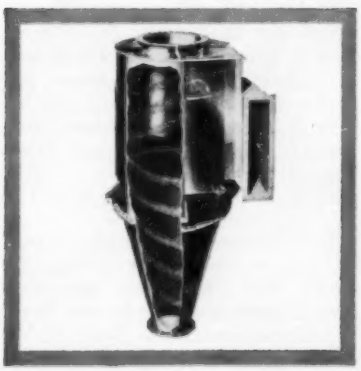
Two promotions at Chain Belt Company, Milwaukee, Wisconsin, have been announced.

Appointed to the new position of manager-market development & sales training is W. B. Marshall, formerly sales promotion manager. In his new position he will assist in the general sales management of the company. He joined Chain Belt in 1920.

G. H. Pfeifer is appointed to the new position of manager-sales promotion and advertising. He was formerly advertising manager.

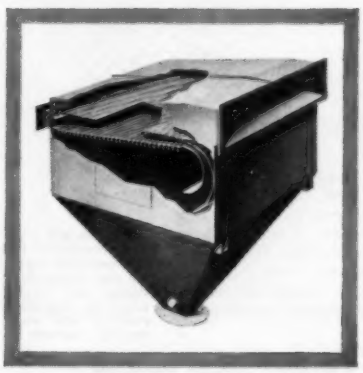
How a Buell Collection System "gangs-up" on dust to meet the toughest air pollution codes





Buell Cyclones also deliver extra collection efficiency to "gang-up" on dust: Exclusive Shave-off design harnesses double-eddy current and puts it to work.

With positive gas flow control for peak efficiency . . . plus continuous cycle rapping to eliminate puffing . . . Buell's "SF" Electric Precipitator really "gangs-up" on dust (even dust with high resistivity) to permit full production even under the most rigid anti-air-pollution codes.



Buell's Low Resistance Fly Ash Collector combines high efficiency to meet present day strictness, with low draft loss for natural or mechanical draft installations.

FOR THE COMPLETE STORY
Write:
Buell Engineering Company
Dept. 18-C, 70 Pine Street
New York 5, New York

buell®

MECHANICAL ELECTRICAL

Experts at delivering Extra Efficiency in **DUST COLLECTION SYSTEMS**

HOW TOUGH

SHOULD WIRE SCREEN BE?

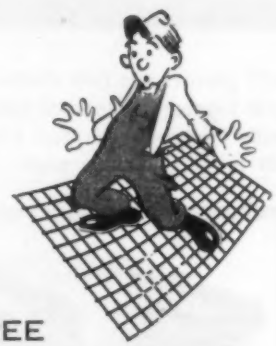
THE ANSWER COULD BE WORTH $64,000 TO YOU!

It may not be worth exactly $64,000 to you but our customers tell us that it saves thousands of dollars to use wire screens that are expertly woven, highly dependable and durable.

Yes, we can tell you exactly *how tough* a wire screen should be for every specific job requirement. A wire screen must be *tough* to withstand the day-in and day-out shattering mechanical abuse of heavy-duty vibrating units. There are four basic facts which determine the "life" of these screen sections: Quality of wire, selection of screen, proper tension, screen craftsmanship.

FLEXIBLE YET RIGID

For uninterrupted service and especially high tonnage proper tension is important. The CLEVELAND Wire exclusive "hooked edge" design practically eliminates bending, slipping, and distortion . . . Ductile, yet strong and durable.



TROUBLE FREE

By providing rigid accuracy of openings, (ranging up to 6") highest quality metals and alloys, proper application of wire screen selection (from flat-top, locked crimp, etc.), CLEVELAND Wire Screens resist abrasion, wear longer, curb shut-down time, reduce blinding, and increase your overall production rating.

We weave and produce wire screens in all commercial metals and alloys—designed and engineered for any type electrical and mechanical vibrator.

Write For Our Vibrating Screen Bulletin.

The CLEVELAND
WIRE CLOTH & MFG. Co.
3576 EAST 79TH STREET • CLEVELAND 5, OHIO

W. W. Munroe Company, St. Louis, Missouri manufacturer's agents, have appointed a distributor for the industrial materials handling trucks of the Baker-Raulang Company, Cleveland, Ohio. Munroe now has sales and service facilities at 728 Evans Avenue, St. Louis, and will shortly expand into a new building where a complete stock of Baker parts and demonstration trucks will be carried.

Peninsular Diesel, Inc., Detroit, Mich., has been appointed distributors for General Motors industrial Diesel engines by the Detroit Diesel Engine Division of General Motors Corp., Detroit, Mich. The company is headed by Clarke F. Andreae as president and M. W. Bever as secretary and treasurer and Diesel manager.

Martin Vander Laan has been appointed manager of operations of the engineering division of Hewitt-Robins, Inc., 157 Chambers Street, New York, N. Y. He joined the company in 1943 as a junior draftsman and has worked in every phase of conveyor design and construction in this country and abroad.

William A. Sine, Jr., has been named to the post of general supervisor production material control and procurement by SKF Industries, Inc., Philadelphia, Penn., manufacturers of anti-friction bearings.

Richard M. Sibley has recently joined the staff of the Dorr-Oliver Eastern Filtration Division in Stamford, Conn., as a sales engineer. He had previously been employed by both the Lederle Laboratories Division and Industrial Chemicals Division of American Cyanamid Company and by Singmaster & Breyer.

P. F. Finley, formerly in charge of the Baltimore sales office for Bemis Bros., has been appointed assistant sales manager for the Kraft Bag Corporation, New York, N. Y., in charge of multiwall bag sales in the Southeastern territory. He will report to F. L. Munger, vice-president in charge of sales at Kraft Bag Corporation's New York office.

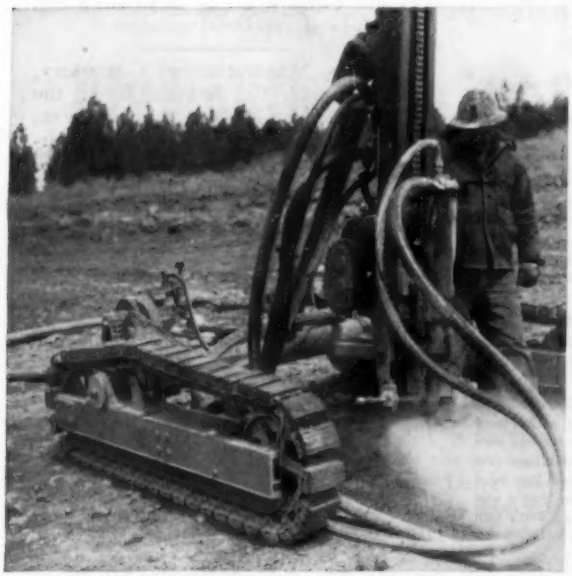
P. E. Bray, who has been engaged in bag-filling machine engineering for many years, has joined Kraft Bag to function as field engineer for the Company's automatic bag filling machine—The Kraftpacker. He will also participate in sales and service on multiwall bags in the Southeastern territory, reporting to Mr. Finley.

Gardner-Denver... Serving the World's Basic Industries

Clambers over rock

Scoots uphill

Goes most anywhere . . . tows own air power
Gardner-Denver self-propelled Air Trac



Puts holes where you want them

Tows its own compressors

Send for the bedrock facts on Gardner-Denver's Air Trac®

GARDNER-DENVER

THE QUALITY LEADER IN COMPRESSORS, PUMPS, ROCK DRILLS AND AIR TOOLS FOR CONSTRUCTION, MINING, PETROLEUM AND GENERAL INDUSTRY

Gardner-Denver Company, Quincy, Illinois

In Canada: Gardner-Denver Company (Canada), Ltd., 14 Curity Avenue, Toronto 16, Ontario

A new paper specialty department has commenced operation at the Bemis Bro. Bag Company's Wilmington, Calif., plant. This department will constitute the first Bemis paper specialty operation on the west coast, an area formerly served by the paper specialty plants at St. Louis, Mo., and Crossett, Ark.

The department at present manufactures only certain basic items. Eventually, however, it will produce a complete line of paper specialties. In charge of the new department is H. M. Wonder, formerly a salesman for Bemis' Los Angeles Sales Division.

A completely staffed regional office has been established in Houston, Tex., to assist in the sale of Chrysler Industrial and Chrysler Marine engines. D. D. Chene, former sales representative for the southwest area has been named regional manager of the new office.

H. E. Markley, formerly secretary of The Timken Roller Bearing Company, Canton, Ohio, has been named to the post of assistant to the president and George L. Deal, formerly treasurer, has been named secretary and treasurer.

Mr. Markley joined the company in 1938 as an accounting trainee. He was successively steel cost supervisor, assistant and chief cost accountant before being named assistant secretary in 1947. In 1953 he was elected to the post of secretary.

Mr. Deal joined the company in 1936. In 1942 he was named treasurer of the Timken Ordinance Company, one of the producers of gun barrels during World War II. In 1947 he was named assistant treasurer and in 1953 he was elected treasurer, which post he retained until his election as secretary and treasurer.

Four changes in its explosives sales organization have been announced by the explosives department of Hercules Powder Company, Wilmington, Delaware. Philip R. Hammond, acting manager of the Pittsburgh office, has been appointed assistant sales manager, and transferred to the Wilmington office.

William T. Marsh, sales manager of Nitrogen Products, at Louisiana, Mo., has been appointed assistant manager of the Contractors' Division in Wilmington.

Thomas E. Brown, manager of the Hazleton, Penn., sales office, has been appointed manager of the Pittsburgh, Penn., office. John H. Wilson, assistant manager of the Hazleton office, has been appointed manager.

Joy Manufacturing Company, Pittsburgh, Pa., has announced the retirement of J. D. A. Morrow as president and his election as chairman of the Board. He has served as president since 1940.

At the same time the directors advanced John Lawrence to president and chief executive officer; W. L. Wearly to executive vice-president; and H. C. Nyquist to vice-president, general sales.

Appointment of Brown-Clark Equipment Company, Inc., Richmond, as distributors of Galion Allsteel products in central and western Virginia is announced by Galion Allsteel Body Company, Galion, Ohio. Sales will be directed by R. L. Brown, Jr., Brown-Clark Equipment Company president.

Fred E. Rau, hoist equipment district sales manager in Cleveland for the Yale & Towne Manufacturing Company, Philadelphia, Pa., has been named to the newly created post of assistant hoist sales manager. He joined the sales staff in 1948 and was appointed to the Cleveland territory in 1952.

Thoroughbreds

for your string!

SPANG

BLAST HOLE BITS and STEMS

Sure winners in performance and production! Spang Bits and Stems, developed by skilled experts, are a safe bet to pace the field in long service and economy. Win, place or show you can be sure with Spang.

① **SPANG CHURN DRILL BITS** drill more holes per bit at lower cost! Fully heat-treated, high carbon, molloy steel, or 4340 steel. They have added strength in pin and blade sections to enable them to take the toughest drilling conditions in stride. Semi-dressed ends speed finish-dressing.

② **SPANG REPLACEMENT BLADE SECTIONS** are for welding to the pin and collar sections of the original bit when it has become worn from long service.

③ **SPANG INTEGRAL ROPE SOCKET TYPE STEMS** with heat treated swivel socket and swivel. Drill more . . . drill longer for less with these rugged, efficient stems. Made from one bar of steel with only a threaded box joint with integral rope socket top the stem's uniformity cuts vibration or whipping. Tools turn freely in the open swivel socket keeping the hole round and straight.

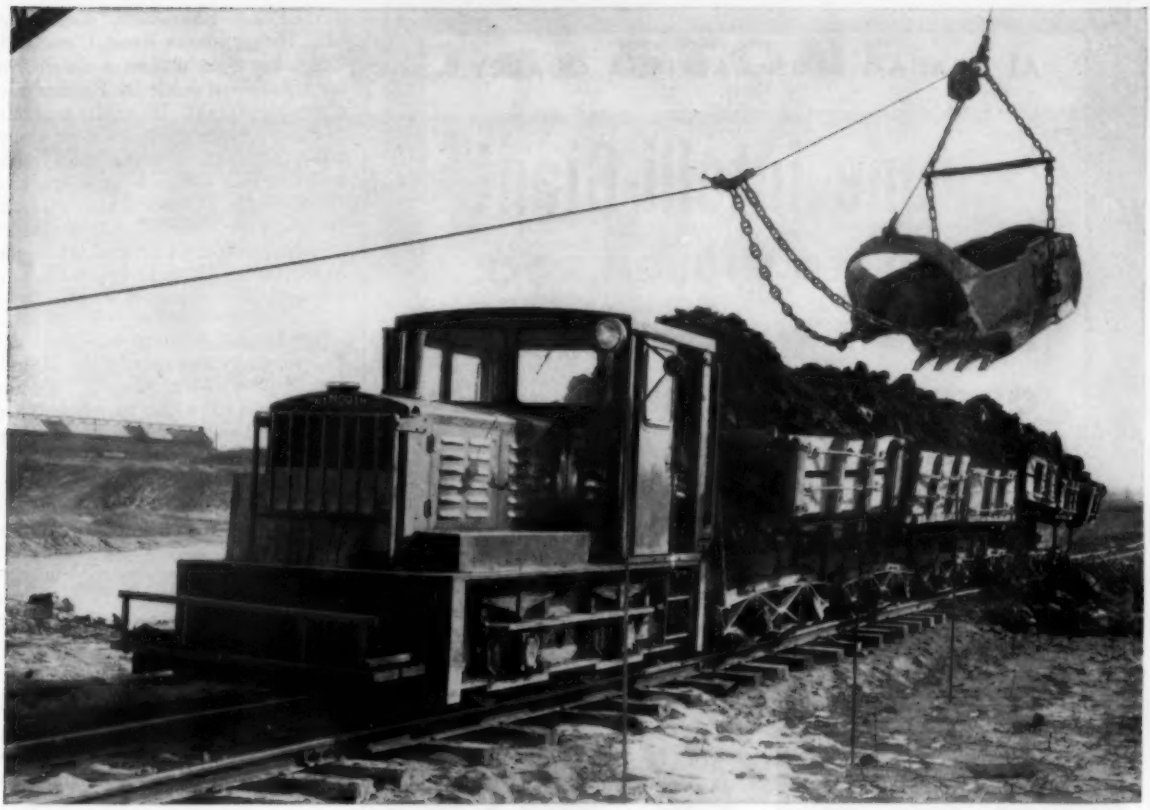
Your inquiries are welcome— contact your nearest Spang dealer or write direct to:

The HIGHER STANDARD

SPANG & COMPANY

DEPT. M-3 BUTLER, PENNSYLVANIA

For over 60 years Manufacturers of Spang Weldless Jars and a Complete Line of Cable System Drilling and Fishing Tools for Oil and Gas Wells, Prospect Drilling and Shot Blast Holes.



AT CHICAGO BRICK CO., DALTON, ILLINOIS

Plymouth Puts its Power on the Payload

WITH ASSIST FROM TORQUE-CONVERTER COUPLING

"Our operation is a common one, and not very dramatic," says Mr. Robert Coleman, Plant Superintendent. "All we require of our locomotive is to be on the job day after day hauling 650 to 700 cubic yards of clay from pits to ovens and do it economically without downtime and maintenance costs."

"And our Plymouth fills this big bill. It operates economically and puts its power on the payload, where it counts. The Torqomotive Drive and the Fuller torque-converter coupling transmit Plymouth's power to the load without spinning the wheels, make starting and stopping smoother, let the Plymouth 'dig' into the job with just the amount of power needed to move the load. It's easy to operate, and we haven't had a bit of trouble with it. We don't waste any power at Chicago Brick now!"

You could be wasting power, adding needless costs to your operation. Find out how a Plymouth can smooth out your operation, cut costs. Models from 3 to 70 tons. Gasoline or Diesel, mechanical or Torqomotive Drive.* Also Diesel-Electrics. Send a brief outline of your requirements for free analysis by F-R-H engineers — no obligation on your part, of course. ADDRESS: PLYMOUTH LOCOMOTIVE WORKS, Division of THE FATE-ROOT-HEATH COMPANY, Dept. A-15 Plymouth, Ohio.

PLYMOUTH® TORQOMOTIVES

*TORQOMOTIVE DRIVE: Plymouth Transmission coupled to a Hydraulic Torque-Converter

ALSO BUILDERS OF F-R-H CERAMIC MACHINERY

AT GRAHAM BROS. CATALINA QUARRY

one intelli-Giant

UNCOVERED ENOUGH ROCK IN A FEW WEEKS TO KEEP OPERATION RUNNING A FULL YEAR!

"Excellent performance record," reports Graham Bros., even though their Intelli-Giant uses corrosive salt water from the nearby Pacific Ocean.

To mine a very steep bank, Graham Bros. first had to remove several feet of clay-laden soil, loaded with large boulders and thick brush growth. An Intelli-Giant was secured and set to work.

Operating at 160 psi and 850 gpm, the Intelli-Giant washed away burden and undercut boulders with such speed that in a few weeks enough rock had been uncovered to keep the operation running for a full year.

Interested in speeding up your quarrying operation? Then by all means investigate the Chiksan Intelli-Giant.

For more information write Dept. 2212

CHIKSAN intelli-Giant

CHIKSAN COMPANY • *Subsidiary of Food Machinery and Chemical Corporation*
Brea, California • Chicago 3, Illinois • Newark 2, New Jersey
Well Equipment Mfg. Corp. (Division) Houston 1, Texas • Chikson Export Company, Brea, Calif.; Newark 2, New Jersey, Chiksan of Canada Ltd., Edmonton, Alta.

WEPCO Equipment Company, 3421 Independence Road, Cleveland, Ohio, has been named a distributor for equipment made by Pioneer Engineering Works, Inc., Minneapolis, Minn., subsidiary of Poor & Company, Chicago. Pioneer sales territory for WEPCO will include all of Ohio. W. E. Plechaty, Cleveland, is president of WEPCO, O. R. Sindelar, Brecksville, is general manager, and Harold Vogel, Brecksville, is general sales manager.

George C. Johnson has been appointed sales manager by the Hamilton Rubber Mfg. Corp., Trenton, New Jersey. For the past five years, he served the company as promotional sales manager.

Mr. Johnson entered the rubber goods industry in 1919 in the Chicago Branch of a well known Industrial Rubber Goods manufacturer. He was appointed manager of that branch from where he moved to the home office as general sales manager. He joined the Hamilton organization in 1950.

L. L. Brooks has recently joined Baldwin - Lima - Hamilton Corporation, Construction Equipment Division, Lima, Ohio, as sales representative. He will make his headquarters in Lima, Ohio. Prior to joining the company, he was associated with Worthington Corporation in Washington, D. C., and Carroll and Edwards Company, Cincinnati, Ohio.

L. L. Seitz, service engineer for the Construction Equipment Division for the past twenty-one years, has been made sales and service engineer for Lima shovels, cranes, and draglines in Western New York.

Byron C. Redeen has been appointed chief engineer at Lippmann Engineering Works, Milwaukee, Wis. He joined the engineering staff at Lippmann in 1944, becoming chief engineer in 1946. In 1950 he transferred to field engineering where he has operated as the company's chief sales engineer for the last five years.

Expansion of the B. F. Goodrich Company's plant in Miami, Okla., to increase tire production will be started immediately, it was announced recently by J. E. Gulick, vice-president-manufacturing of the company's tire and equipment division and Walter E. Head, plant manager. One of the largest of the B. F. Goodrich tire plants, the factory here is presently employing more than 1500 and is one of the largest manufacturing operations in Oklahoma.

SAND or STONE...

it's all the same to the PAYLOADER®

The quick acceptance and success of the 4-wheel drive tractor-shovel probably has no parallel in material-handling equipment history. Pioneered and first introduced by Hough in 1948, this type of machine is numbered in the thousands among pits, quarries, mines, contractors, public bodies and industrial plants. Hough leadership and pioneering in the 4-wheel drive field continues and is presently represented by three new "PAYLOADER" sizes — all incorporating the "know-how" and new features that result in better performance — more production, easier and faster—at lower net cost. All three have powerful pry-out action and 40 degree bucket tip-back at ground level to dig faster, get bigger loads and carry bigger loads — safely. All three have more powerful engines — a choice of gasoline or diesel — and many other more-yardage features.

Your "PAYLOADER" Distributor will be glad to show what these new units can do — for you.

PAYLOADER®
MANUFACTURED BY
THE FRANK G. HOUGH CO. LIBERTYVILLE, ILL.
SUBSIDIARY INTERNATIONAL HARVESTER COMPANY

3 NEW 4-WHEEL-DRIVE MODELS

MODEL **HO** 2 cu. yd.

MODEL **HH** 1½ cu. yd.

MODEL **HU** 1 cu. yd.

THE FRANK G. HOUGH CO.

750 Sunnyside Ave., Libertyville, Ill.

Send full data on new 4-wheel drive "PAYLOADER" tractor-shovels.

☐ Model HO ☐ Model HH ☐ Model HU

Name .....

Title .....

Company .....

Street .....

City .....

State .....

Typical installation of Marcy CPD Mill

how

MARCY EXPERIENCE

grinding specification sands

gives you

BETTER SAND PRODUCT...LOWER OPERATING COSTS... GREATER FLEXIBILITY IN MEETING SPECIFICATIONS

Mine and Smelter has specialized in the design and manufacture of Marcy grinding mills since 1915. Extensive experience in the stone products field resulted in development of the Marcy Center Peripheral Discharge Grinding Mill. This development, initiated in 1940, has resulted in a great number of sand installations for government projects and commercial operations.

BETTER SAND PRODUCT

Grinding in a Marcy CPD Mill produces a uniformly cubical shaped product with same characteristics of shape and strength throughout the range of sizes produced. This results in:

- stronger concrete
- better finish on concrete
- better slump characteristics
- use of less cement

OPERATING ADVANTAGES

Compared with crushing, experience has proved these additional advantages of grinding by Marcy CPD Mills:

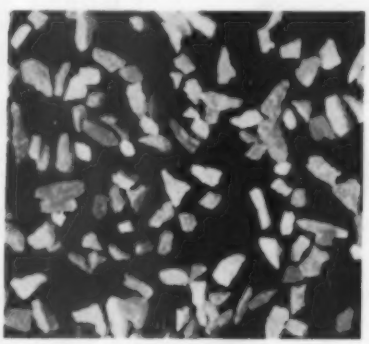
LOW COST ... low maintenance, less steel consumption and less power per ton result in an overall cost generally less than 25c per ton, exclusive of ammortization.

FLEXIBILITY ... by varying rate of feed, pulp dilution and discharge port area it is possible to change gradation of finished product to meet different specifications.

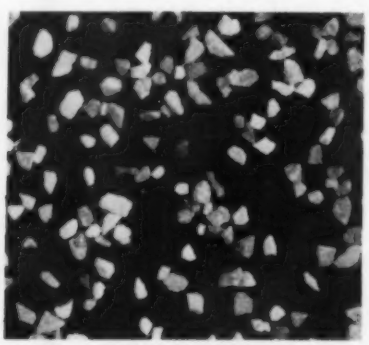
CLEANER OPERATION

WET OR DRY GRINDING

CAPACITIES FROM 2 TO 200 DRY TONS PER HOUR



CRUSHER PRODUCT



MARCY CPD MILL PRODUCT

Identical rock samples were put through a crusher and a Marcy CPD Mill. The resulting products, screened to —10 +14 mesh, are shown above. Note the elongated shape and sharp, weak edges of the crushed product compared with the uniformly cubical Marcy Mill product.

The Mine & Smelter Supply Co.

Denver • Salt Lake City • El Paso • New York

Representatives in Foreign Countries

WRITE FOR CATALOG

SPECIALISTS IN GRINDING FOR FORTY YEARS

Two district representatives have been added to the staff of Athey Products Corporation, Chicago, Illinois.

Newly appointed district representative in the southwest United States is Charles Z. Holmes. His experience in the construction and earthmoving business includes branch manager for a Canadian Athey-Caterpillar dealer, general superintendent of two large western contractors, and district representative for the Hyster Company.

Mike Hunter is Athey's newly appointed district representative in the northeastern United States. He has trained in Caterpillar Tractor Company's sales training program and has been employed by Ulrich Products Corporation and the Hyster Company.

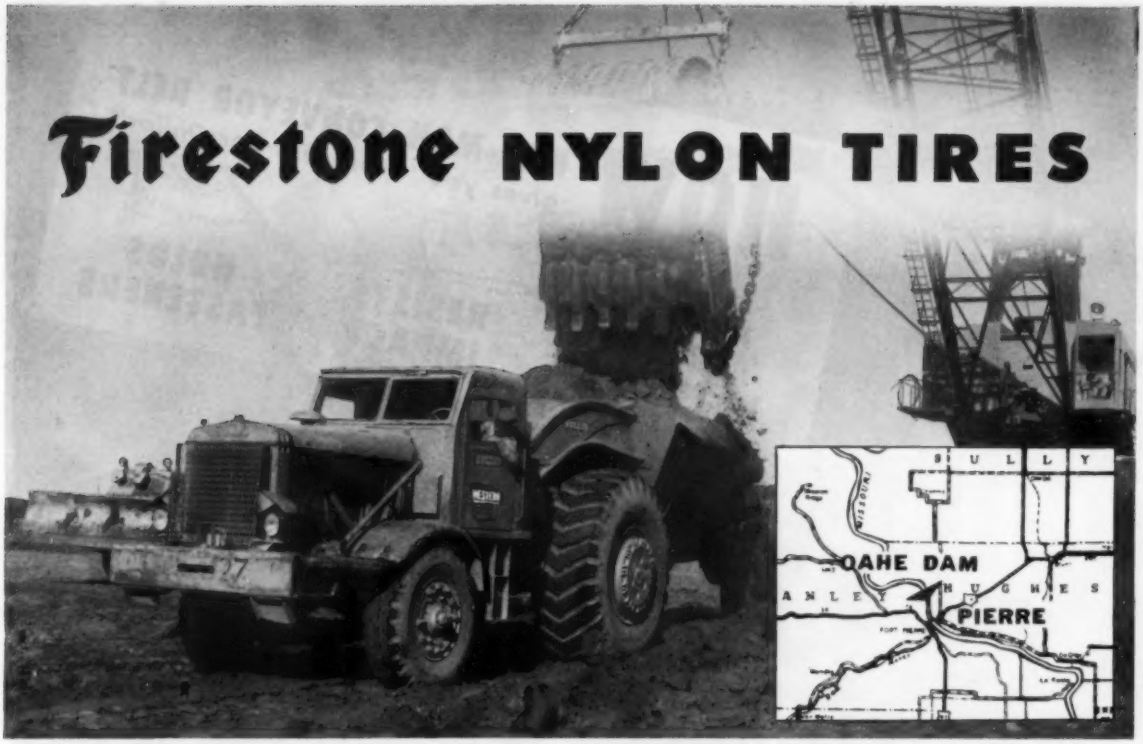
In his 45 years of export sales, Paul H. Malenchini introduced products ranging from optical lenses to power shovels and huge earth moving equipment in almost every country in the world. His retirement as export manager of Euclid Division, General Motors Corporation, Cleveland, Ohio, completes 16 years association with that company.

John J. Refieuna has been named as sales engineer in the Western sales district of Raybestos-Manhattan, Inc., Passaic, N. J. He brings to his new assignment a broad background of conveyor belt experience. He will service the large conveyor equipment manufacturers, mining companies and other heavy industrial accounts in his territory from R/M's Chicago office.

J. D. Hitch, Jr., president of Dorr-Oliver Incorporated, Stamford, Conn., and John L. Merrill, president of Merco Centrifugal Co., San Francisco, Calif., have announced that Dorr-Oliver Incorporated will acquire all of the business and substantially all of the assets of Merco Centrifugal Co. in exchange for shares of common stock of Dorr-Oliver Inc.

F. H. Holmes, vice-president in charge of The Texas Company's Research and Technical Department, New York, N. Y., has announced that Texaco will expand its specialized service to Southern industry by opening a Regional Office of the Technical Service Division in Atlanta, Georgia. Address of the new service headquarters will be 873 Spring Street, N.W. The office will be under the direction of J. F. Collins, Jr.

Firestone NYLON TIRES



MOVING 60,000 CUBIC YARDS A DAY TO HELP TAME THE MIGHTY MISSOURI

THE earthmoving unit shown above is typical of the many Firestone equipped units that are running round the clock to speed construction of Oahe Dam on the Missouri River. When completed, Oahe Dam will be the largest rolled filled earth dam in the world.

It is on projects such as this that Firestone nylon tires prove their superiority in reducing tire costs and downtime.

Firestone nylon tires are built for the toughest service. The treads give maximum traction and they are extra tough to resist cutting. Double-thick sidewalls give added protection against cuts and snags.

Firestone's Safety-Tensioned Gum-Dipped nylon cord body gives greatest protection against impact breaks . . . flex breaks . . . heat failures . . . and water damage.

Let your Firestone Dealer or Store show you how Firestone nylon tires will cut downtime and increase the profits on your job.

A TIRE FOR EVERY ROAD, LOAD AND CONDITION OF SERVICE

GROUND GRIP · GG WIDE BASE · ROCK GRIP · RG WIDE BASE · ALL NON-SKID · ALL TRACTION · RIB EXCAVATOR

WHEN YOU BUY NEW EQUIPMENT OR REPLACEMENT TIRES, SPECIFY FIRESTONE

Enjoy the Voice of Firestone on radio or television every Monday evening over ABC

Copyright 1956, The Firestone Tire & Rubber Co.

Many Users Say This Belt Outlasts Them All

The Ray-Man Conveyor Belt features a new and different construction of covers and strength member to resist cuts, tears and abrasion to a degree never before attained. R/M's exclusive "XDC" Cover provides a degree of protection and long life not possible with any other belt. Inside this cover, Ray-Man Conveyor Belt combines elastic cushioned strength member plies in an envelope of strong, yet flexible synthetic fabric to resist gouging and tearing ... to take the impact of large, abrasive lumps... to permit the belt to trough easily and train naturally.

Like all Manhattan heavy duty conveyor belts, Ray-Man is moisture resistant and mildew-proof. It requires no breaker strip and holds fasteners considerably better than other types of belts. Let an R/M representative show you the advantages of Ray-Man as well as other R/M conveyor belts, including Homocord, with its extra cushion for unusually abusive shock loading. He'll help you select the belt best suited for your job . . . one designed to give you "More Use per Dollar." Write for Bulletins 6906 and 6915.

RM-600A

MANHATTAN RUBBER DIVISION—PASSAIC, NEW JERSEY

RAYBESTOS-MANHATTAN, INC.

Other R/M products include: Industrial Rubber • Fan Belts • Radiator Hose • Brake Linings • Brake Blocks • Clutch Facings Asbestos Textiles • Packings • Engineered Plastic, and Sintered Metal Products • Laundry Pads and Covers • Bowling Balls

minimum end taper... more service life with

CF&I GRINDING RODS

End taper of grinding rods results in uneven wear, which in turn reduces service life. CF&I Grinding Rods are fabricated so as to reduce end taper to a minimum.

In producing grinding rods CF&I strives for a product that will wear evenly and give the longest possible service life. The proper analysis of steel results in the required hardness and superior resistance to bending.

Manufactured under continuous CF&I control and supervision, every CF&I Grinding Rod is carefully rolled . . . machine straightened . . . has square cut ends . . . and is thoroughly inspected at every stage of its production.

Investigate the advantages to be gained by using CF&I Grinding Rods in your operation. Available in ½" increment sizes from 1½" to 4" in diameter. Contact the CF&I District Sales Office nearest you.

Other CF&I Steel Products for the Sand and Gravel Industry

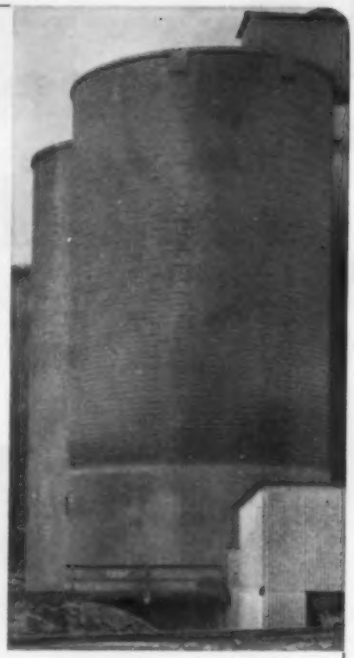
Grinding Balls • Wickwire Rope
Light Rails and Accessories
Cal-Wic Industrial Screens

GRINDING RODS
THE COLORADO FUEL AND IRON CORPORATION

Albuquerque • Amarillo • Billings • Boise • Butte • Casper • Denver • El Paso • Ft. Worth
Houston • Lincoln (Neb.) • Los Angeles • Oakland • Oklahoma City • Phoenix • Portland
Pueblo • Salt Lake City • San Antonio • San Francisco • Seattle • Spokane • Wichita
CANADIAN REPRESENTATIVE at Vancouver

3187

2 of the 6 Neff & Fry Bins at National Gypsum



These two 30′ dia. x 66¼′ high bins are used by National Gypsum Co. at Bellefonte, Pa., for handling and storing raw lime from the kiln.

We've had experience in erecting bins and helping to design conveying systems for nearly 100 kinds of flowable bulk materials. This experience will prove valuable to you if you have such a project in mind.

There are many advantages in our type of bin construction. The outstanding feature is the Super-Concrete Stave with diagonal ends—dense and hard, does not spall or rust or burn.

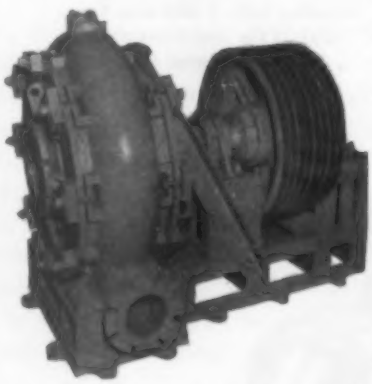
Our folder, "Bins With the Strength of Pillars," is well worth a few minutes reading time. You are invited to ask for a copy.

NOT EXPORTED EXCEPT TO CANADA AND MEXICO

THE NEFF & FRY CO. • 278 Elm St. • Camden, Ohio

SUPER-CONCRETE STAVE STORAGE BINS

MECKUM *Material Handling Pumps*



★ Low initial & operating cost.

★ Engineered individually for hydraulic efficiency and simplicity of maintenance.

★ All wearing parts made of alloys to suit various types of materials pumped.

★ Ease of assembly of replacement parts reduces shut down time.

Another progressively engineered product. In sizes from 4″ to 30″.

Also manufacturers and suppliers of complete dredges, pipe, fittings and equipment necessary to efficient production of materials.

Write us for details or nearest installation.

MECKUM ENGINEERING, INC.

53 W. Jackson Blvd., Chicago 4, Ill. Dayton Road, Ottawa, Ill.

Sal Colacuori has been appointed to the newly created position of sales supervisor, motor truck product development, International Harvester Company, Chicago, Illinois.

Mr. Colacuori, since 1948 general supervisor of motor truck sales engineering, has been succeeded in that assignment by N. L. Ginder, sales engineering consultant.

Knight Equipment Company, 1760 Kelly Road, Richmond, Virginia, has been appointed Marion Power Shovel Company distributor for Central and Western Virginia. Officers of the company are: Frank G. Knight, president; Fred A. Kingston, executive vice-president; and James G. McCann, Jr., secretary-treasurer.

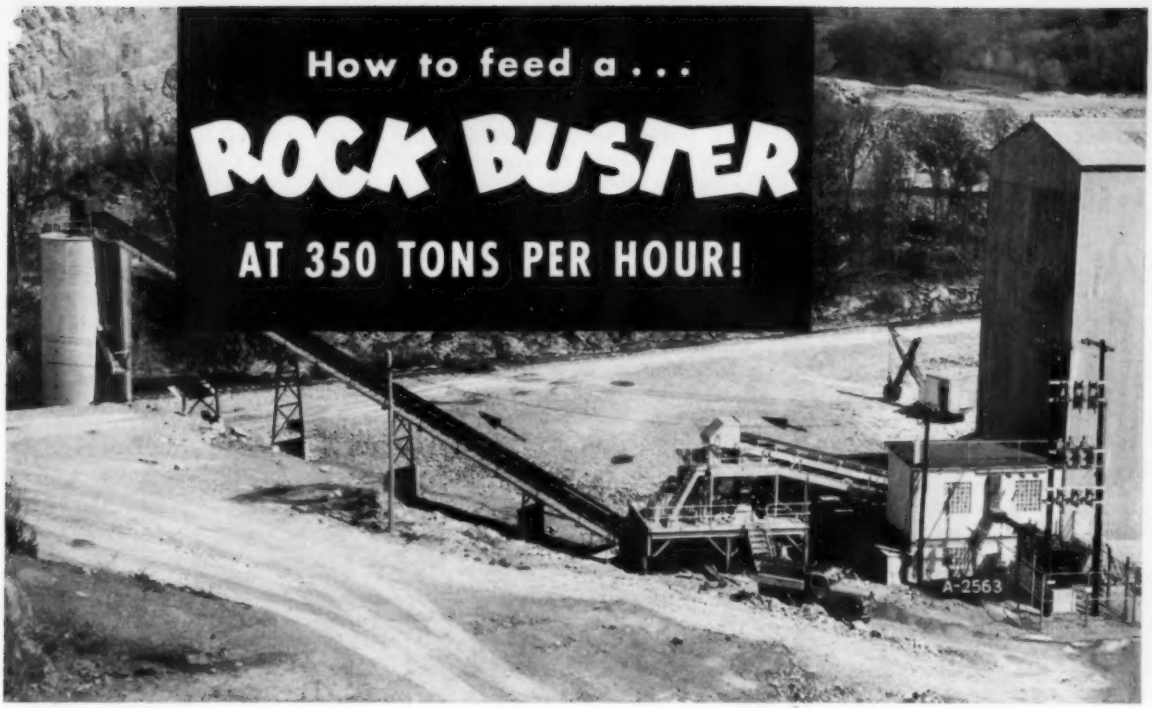
Machinery and Supplies Company, Inc., 2000 Walnut Street, Kansas City, Missouri, has been appointed a Marion distributor for the state of Kansas and the western third of the state of Missouri. Officers of the company are: George W. Gagel, president; Lloyd C. Smith, vice-president; John W. Gagel, treasurer; and Ray C. Wagner, secretary.

Marion Power Shovel has also appointed George L. Moritz divisional sales manager in the eastern sales area and Lawrence E. Schaffer divisional sales manager in the central sales area.

Walter Conway has been named sales manager for the Bemis Bro. Bag Company Flexible Package Plant, Chicago, Illinois. He has been with Bemis since 1945, doing sales work with national accounts in the New York general sales division.

The consolidation of two of the country's oldest and best-known names in truck equipment—Gar Wood and St. Paul—has been announced by Edward F. Fisher, president of Gar Wood Industries, Inc., Wayne, Michigan. Products carrying the new Gar Wood—St. Paul name will include a wide range of dump truck bodies and special bodies, hydraulic dump truck hoists, elevating Frate-Gates, and Hi-Lift hoists.

Appointment of Maday Body Works, 38 A Street, Buffalo, as distributor of Galion Allsteel products in western New York is announced by Galion Allsteel Body Company, Galion, Ohio. Maday Body Works' sale of Galion equipment in its newly-assigned territory will be directed by Walter and Henry Maday, heads of the company.



HARBISON-WALKER PLANT, BARABOO, WIS.

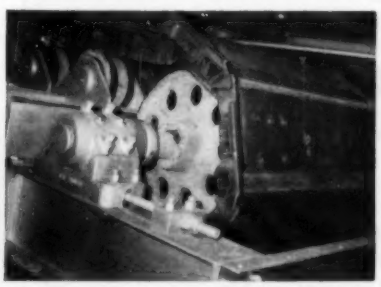
STEPHENS-ADAMSON CONVEYOR SYSTEM GETS A RUGGED TEST WITH GANISTER ROCK

Ganister rock is one of the toughest, most abrasive materials a conveying system can be exposed to. Processed into refractory brick by the Harbison-Walker Refractories Company, it is shown here being quarried at Baraboo, Wisconsin. This Stephens-Adamson installation takes continuous brutal punishment yet delivers steady, economical service with minimum maintenance.

An S-A Amsco manganese steel pan feeder supplying a primary crusher absorbs the jarring impact delivered by thousands of tons of rock ranging in size from 18 inches to 30 inches. Belt conveyors carry sharp, jagged lumps.

Designing heavy duty conveyor equipment that can take it and dish it out is nothing new for S-A engineers. Their tremendous experience plus a full line of S-A conveyor products can always be counted on to provide the most economical method of bulk material movement.

Head end of picking belt. Long center rollers distribute load.



Amsco manganese steel feeder actually toughens with usage.

48 inch belt conveyor runs under complete length of manganese steel feeder.

Designers and manufacturers of conveyors, elevators, screens, and transmission equipment.

STEPHENS-ADAMSON MFG. CO.

20 Ridgeway Avenue, Aurora, Ill.–Los Angeles, Calif.–Belleville, Ontario

ENGINEERING DIVISION
Designers and manufacturers of all types of bulk materials conveying systems.

STANDARD PRODUCTS DIVISION
A complete line of conveyor accessories—centrifugal loaders—car pullers—bin level controls, etc.

SEALMASTER DIVISION
A full line of industrial ball bearing units available in both standard and special housings.

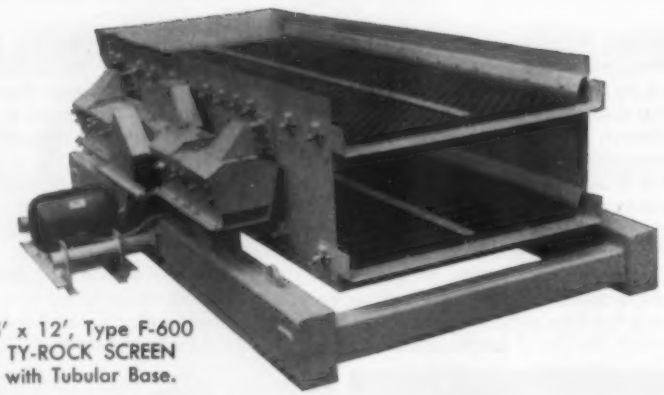
Warren Holden, president and general manager of Construction Machinery Company, Waterloo, Iowa, has announced that company's sale of its interest in the Construction Machinery Sales Company, Waterloo, Iowa. Construction Machinery Sales Company has been an affiliate of Construction Machinery Company since 1945.

To avoid any confusion in the future between the two companies due to the similarity of their names, the name of Construction Machinery Sales Company is being changed to Engineered Equipment Inc., and this company will operate under separate ownership and management.

E. W. Hoogstra, manager of sales and service for Cummins Illinois Engine Sales, Inc., Chicago, Illinois, has been elected vice-president. Cummins Illinois Engine Sales is the sales and service organization for the Cummins Engine Company, Inc., Columbus, Ind.

Mr. Hoogstra has been associated with Cummins for seven years as a sales engineer, sales manager and manager of sales and service. Before joining Cummins, he was sales manager for the Venn-Severin Machine Company, manufacturers of slow speed diesel engines. Earlier, he had been a member of the sales department of the Buda Company.

FOR PROFITABLE SCREENING USE



5' x 12', Type F-600 TY-ROCK SCREEN with Tubular Base.

TYLER VIBRATING SCREENS AND TYLER WOVEN WIRE SCREENS

There is a Tyler Vibrating Screen for every sizing and dewatering job. Tyler Screens are noted for the huge tonnages handled with top efficiency and low cost per ton.

Tyler Woven Wire Screens are made in all meshes and metals in over 10,000 different specifications. Ton-Cap and Ty-Rod Screens with the long-slot openings provide the greatest capacity for a given discharge area.

THE W. S. TYLER COMPANY
CLEVELAND 14, OHIO
Manufacturers of Woven Wire Screens and Screening Machinery

Donald L. Shirley has been appointed Pacific Northwest sales manager for Link-Belt Company, Chicago, Illinois. He will have responsibility for sales in Washington, Oregon, parts of Idaho and Montana, and Alaska, and will continue to make his headquarters at the company's plant in Seattle.

Mr. Shirley has been district sales manager for the Seattle district for the past year and a half and served with Link-Belt for over 30 years at Seattle, Portland, Philadelphia, and Indianapolis.

Donald L. Shirley

Philip A. Mulvey

Republic Rubber Division, Lee Rubber & Tire Corporation, Youngstown, Ohio, recently announced the appointment of Philip A. Mulvey, Jr., to their Field Sales Organization.

Mr. Mulvey will work out of Republic's Chicago District Office, where he will be responsible for the sales and service of Republic's line of hose, belting and packing in the territory formerly covered by I. G. Wollter, recently appointed Chicago District Manager.

J. D. Anderson becomes general sales manager of the Jaeger Machine Company, Columbus, Ohio, succeeding J. H. Yearling who assumes the new position of director of market promotion.

Mr. Yearling has been associated with Jaeger for 28 years, serving as sales manager since 1949.

Mr. Anderson has been 21 years with the company and was a divisional sales manager prior to becoming general sales manager.

Four representatives have been newly named to Allis-Chalmers industries group offices in the country's north central region. They are Robert E. Ochs, Cincinnati, Ohio; Clifford R. Gentrup, St. Louis, Mo.; and James W. Koontz and Robert E. Southard, assigned to the Chicago, Ill., district office. The men will specialize in the sale of the company's general purpose equipment products.

BETTER FRAGMENTATION produced by new Akremite process permits stripping units to move 25% more material.

Blasting Costs Cut 50%, Stripping 25% More Efficient, with New Akremite Method

Spencer prilled Ammonium Nitrate is key ingredient in new "make-it-yourself" explosive

By F. M. Robertson, Supt, DeBardeleben Coal Corporation

During one year of testing Akremite, the new "make-it-yourself" explosive, we of the DeBardeleben Coal Corporation at Sipsey, Alabama, have had the following experiences:

(1) We can cut blasting costs as much as 50%. (2) Better fragmentation permits stripping units to move 25% more materials per hour. (3) A dramatic series of tests has proved that Akremite is one of the safest possible explosives.

This simple but revolutionary new explosive is the brainchild of R. L. Akre, superintendent of drilling at Maumee Collieries Co., Terre Haute, Ind., using prilled Ammonium Nitrate produced by Spencer Chemical Company.

Ammonium nitrate by itself is not an explosive. But it was Akre's idea to mix ammonium nitrate with carbon black and pack it in a polyethylene bag. When the bag is confined in a drill hole and detonated with a high gelatin dynamite and primacord, it produces a tremendous explosion. Because the mixing operation is so simple and safe, it can be done right at the mine location.

To find out how safe Akremite actually is, we asked Southern Research Institute at Birmingham to put the new explosive through a series of tests. The testers fired bullets into bags of freshly made Akremite. They also conducted the regular pendulum-friction and modified propagation-through-air tests.

No explosions, fire, or crackling resulted from any of these tests, although the rifle-bullet impact test on dynamite produced four violent explosions out of four trials.

Simpler, safer, cheaper, better, Akremite is fast becoming the favorite explosive for strip mining.

(NOTE: Spencer Chemical Company will be happy to provide you with further information about the Akremite Method as discussed by Mr. Robertson.)

SPENCER CHEMICAL COMPANY

610 Dwight Building • Kansas City 5, Mo. • BAltimore 1-6600

The Frank G. Hough Co., of Libertyville, Illinois, manufacturers of *PAYLOADER* tractor-shovels and tractors, announces the appointment of Ralph E. Zimmerman as district representative, covering New York and Pennsylvania (excluding the New York City and Philadelphia areas).

Mr. Zimmerman has had considerable selling experience on equipment for the industrial and construction fields at both the manufacturer and distributor level and has completed an extensive training program at the Hough plant to familiarize himself with the complete line.

R. E. Zimmerman

Dean Calland

Marion Power Shovel Company, Marion, Ohio has announced a strengthened sales organization in the southwestern states, headed by Dean Calland as western sales manager. His headquarters are at 326 Shaw Road in South San Francisco, Calif.

Two Divisional sales managers have been named to work with him in expanding sales and service in California, Nevada, Utah, and Arizona. They are T. R. Fogelberg, 4835 Crenshaw Boulevard, Los Angeles, and E. J. Riggs, located at the company's parts warehouse at 1017 North 22nd Avenue in Phoenix, Arizona.

Mr. Calland has been with Marion Power Shovel Company for six years. He was district manager at St. Louis for one year and has been district manager at San Francisco for the past five years.

Jesse A. MacIntire, Jr., presently Chicago district manager, has been promoted to manager wire braid hose sales for the Republic Rubber Division, Lee Rubber & Tire Corp., Youngstown, Ohio. He joined Republic in 1953 as assistant manager, wire braid hose sales and has been Chicago district manager since July, 1954.

Irving G. Wollter, presently a field representative in Chicago, will replace Mr. MacIntire as Chicago district manager. He has been with Republic since 1933.

S. K. Porter has been elected vice-president of the Fruehauf Trailer Company, Detroit, Mich. He joined the company in 1935 as a mechanic at the Los Angeles branch, and has been serving as Fruehauf's general sales manager of the Pacific Coast Division. He will continue to be in charge of Fruehauf's ten West Coast sales and service branches as well as two trailer-producing factories.

John C. Carlile has been appointed as district sales manager for the Southwestern sales territory by Schield Bantam Company, Waverly, Iowa. He will manage the territory including California, New Mexico, Arizona, Colorado, Nevada, and the extreme western part of Texas.

Prior to his appointment, Mr. Carlile had, for three years, been district sales representative for Le-Tourneau-Westinghouse and the J. D. Adams Company. Before that he had been wtih the Bucyrus-Erie Company for eight years, serving three years as a service representative and five years as a district sales representative in the Tractor Equipment Division.

John C. Carlile

Francis A. Diel

Francis A. Diel has been appointed to the position of New York district sales manager for the American Chain Division of American Chain & Cable Co., Inc., New York, N. Y.

Mr. Diel, associated with the chain industry for a period of 27 years, was first employed by Columbus McKinnon Chain Co., North Tonawanda, N. Y. from 1928 to 1930. From 1930 to 1954, he was with the Bridgeport Chain & Mfg. Co., Bridgeport, Conn., and was their general manager since 1935. In 1954, he transferred to the Chain Division of Republic Steel as district sales manager prior to his association with ACCO.

Willard E. Hahn, vice-president, has been named manager of manufacturing for all St. Regis packaging and converting plants as well as for the Engineering and Machine Department and the Wire Tie Department of the St. Regis Paper Company, New York, N. Y. He will continue to be responsible for all bag manufacturing and will have the added responsibility for St. Regis packaging and converting production in the United States, Puerto Rico, and Canada.

Succeeding Mr. Hahn as resident general manager at the Pensacola Kraft Center is William E. Caldwell, who has been resident manager for all St. Regis operations at Kalamazoo, Michigan. Prior to that, Mr. Caldwell was manager of the St. Regis Panelyte plastics plant at Trenton, New Jersey.

Austin L. Hawk has been named as manager—Western Sales District (Chicago), of Raybestos-Manhattan, Inc., Passaic, N. J. He will supervise the sales of Industrial Rubber Products and Mechanical Packings. with sales staffs at Chicago, Ill. and Denver, Colo., where offices and warehouses are maintained.

Joining Raybestos-Manhattan in 1929, Mr. Hawk advanced through various posts, becoming assistant district manager in 1951. His present appointment succeeds J. B. Wittrup, retired after more than 40 years of service. Mr. Wittrup was western district manager since 1944, and was well known in the industrial and agricultural fields.

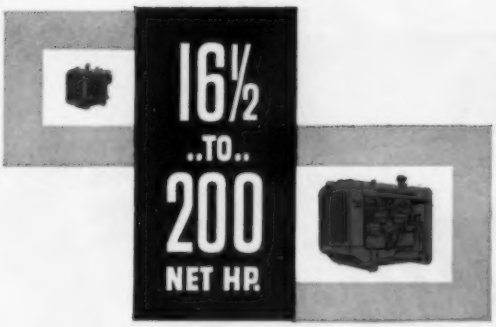
Raybestos-Manhattan has also announced the following appointments for the Western Sales District: H. C. Abrams, Regional Manager; Arthur Arguedas, Supervisor — Belt Sales and Engineering; G. E. Lawrence, Supervisor — O.E.M. Agricultural Sales.

Austin L. Hawk

John J. Wilber

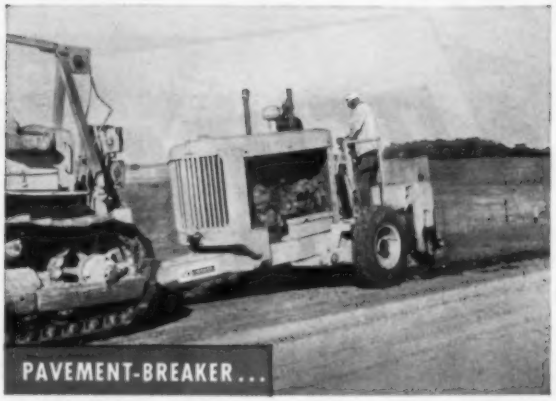
John J. Wilber has been appointed manager of Bailey Meter Company's Cleveland district sales office. He succeeds C. C. McClelland who has retired.

Mr. Wilber started with the company in 1941 as a sales-service engineer and was assigned to the Cleveland district office, now located at 14901 Woodworth Rd., Cleveland, Ohio.

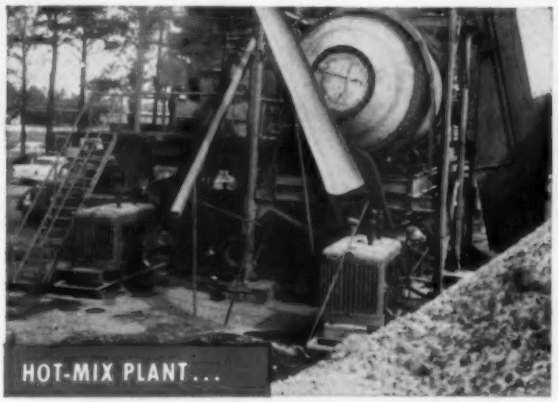


Choose your power from 18 work-proved INTERNATIONAL® UNITS!

Whether you're buying new machinery, or replacement engines, specify the International power unit size that correctly fits your needs—be it for shovel, mix plant, grader, compressor, sawmill, or crusher. Pick the fuel with the local economy advantage! You'll get a heavy-duty unit with the inbuilt tinkerless simplicity of positive temperature control, that features full-length water jackets. You'll get special-delivery pressure lubrication through drilled passages. You'll get wear-defiant, stress-resistant, induction-hardened crankshaft bearings. You'll get the many other International stay-put, extra-value features. You have the choice of 6 diesel, or 12 carbureted work-proved International Industrial Power Units, 16.5 to 200 hp.

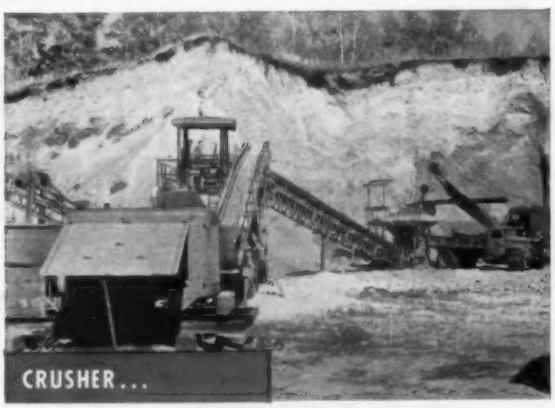


This UD-24-powered preparizer chews up 2 miles of 24-ft pavement per 8-hour day for Contractor G. A. Watson, Barneveld, Wis. He says, "My equipment is International-powered because International engines are dependable, and backed by a company that gives service when needed."



Nello L. Teer Co, Durham, N. C., powers this hot-mix plant with an International 190 hp UD-24 on the tower, another UD-24 at the dryer, and a 125 hp UD-18A on the fan. Plant output on U. S. Hwy 13 job in Maryland averaged 1,000 tons per 10-hour day.

City of Danville (Va.) replaced original engines in two ½-yd shovels with 75 hp UD-350's. "These IH engines sure cut operating costs," says Works Director H. Bowling. Each shovel uses only 17 gal of fuel to produce 95 five-yard loads per day.



In 12,000 hours work over 7 seasons, the 190 hp UD-24 powering Sheboygan County's crusher has needed only one overhaul. It produces 700 tons of crushed stone per average day. "Most dependable engine we know of," says the pit superintendent.

Your International Industrial Power Distributor or Power Unit Dealer is qualified to recommend and install the correct engine size for your needs—and to provide parts and service on it promptly and competently. A good deal awaits you—see him soon!

International Harvester Company, Chicago 1, Illinois

INTERNATIONAL HARVESTER

INTERNATIONAL
INDUSTRIAL POWER

PROVE HENDRIX BUCKETS BEST

The large percentage of "repeat orders" for Hendrix Dragline Buckets is real evidence of satisfaction. Their outstanding performance and reputation for delivering more production at lower costs makes them the first choice of progressive operators.

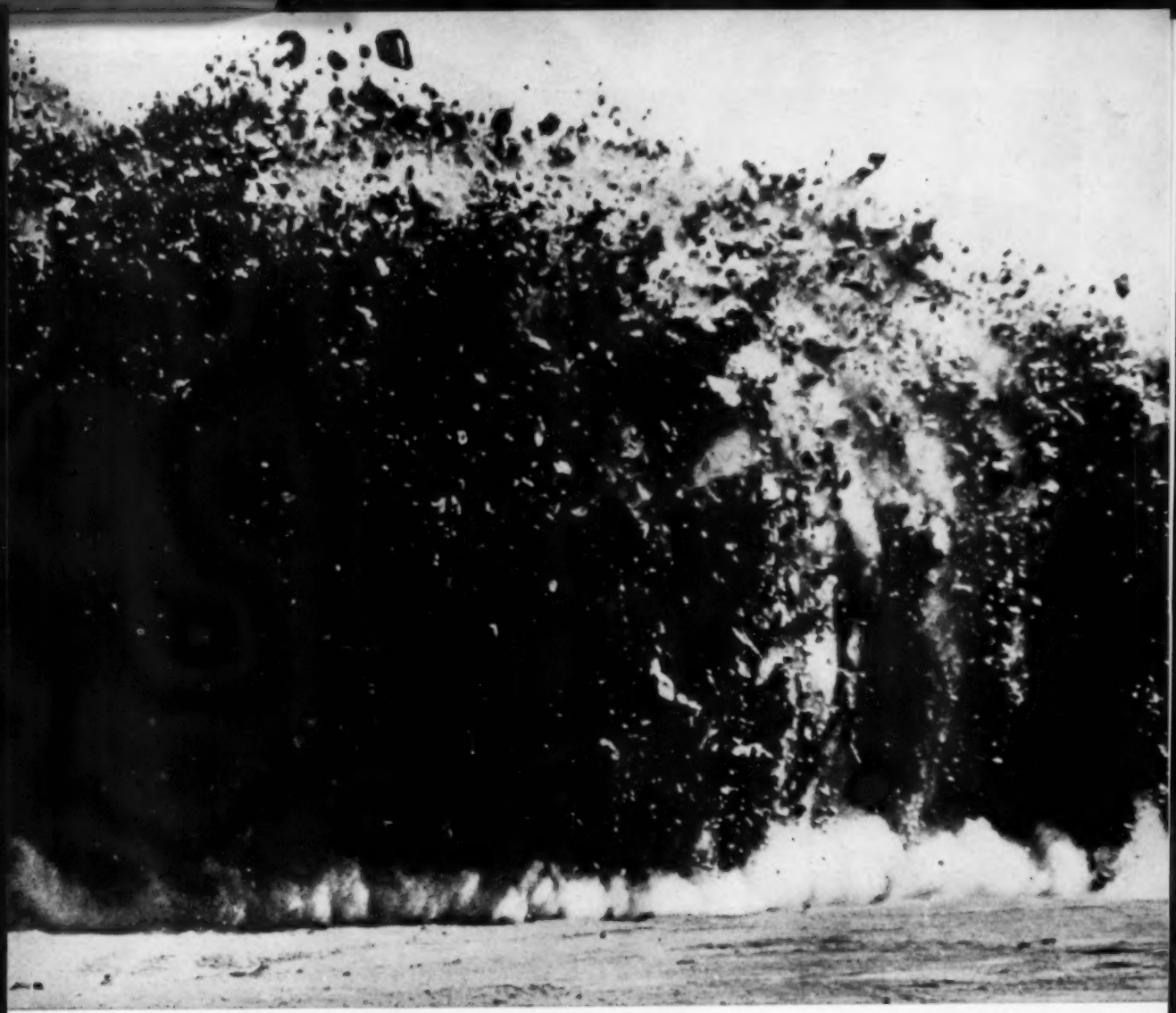
A TYPE FOR EVERY DIGGING PURPOSE

¼ to 40 Cubic Yards

All Hendrix Buckets available without perforations

HENDRIX MANUFACTURING CO., Inc.
MANSFIELD, LOUISIANA

Hendrix Lightweight DB Dragline Buckets



EXPLOSIVES RESEARCH IN ACTION

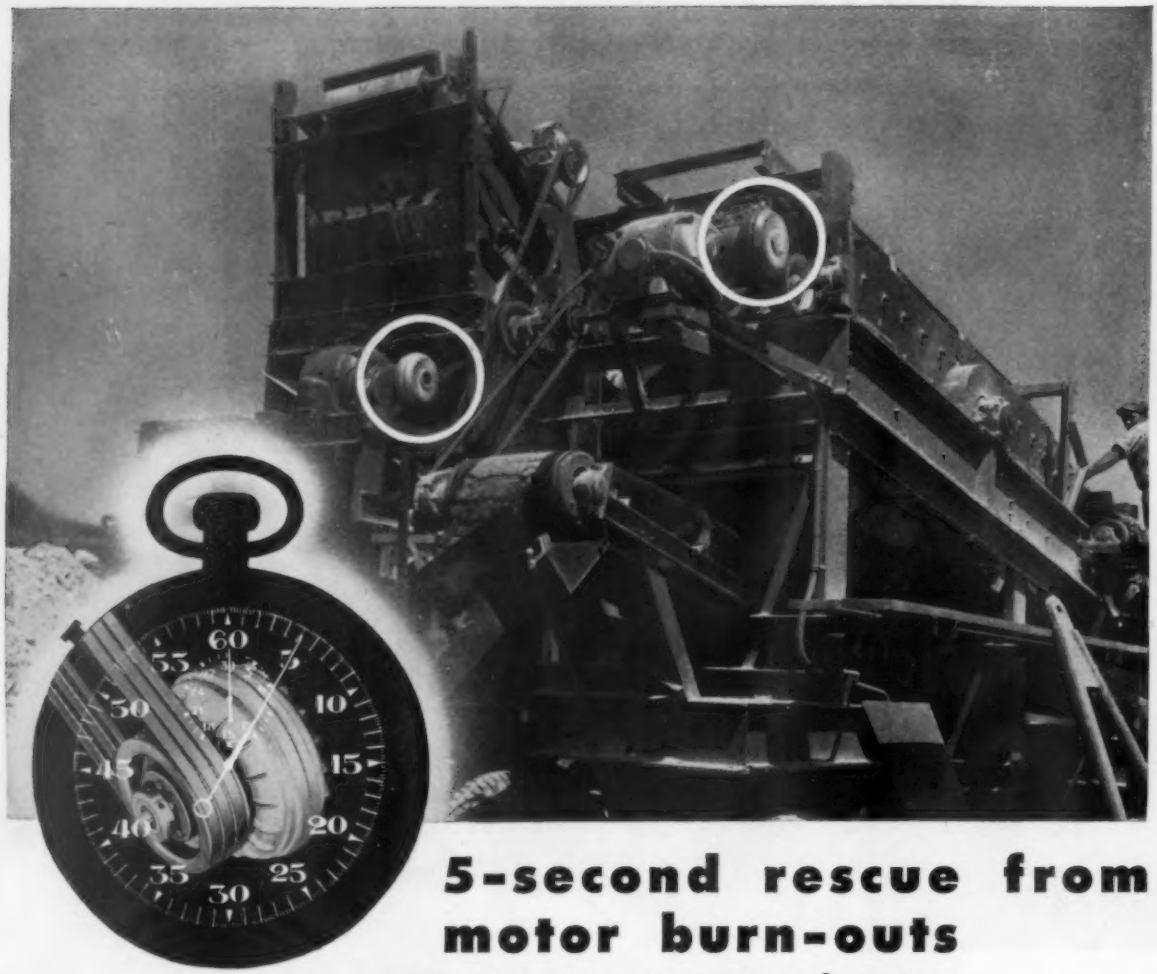
This photograph of a blast of 27,000 pounds of Hercules® explosives in a traprock quarry is conclusive proof of how proper explosives technique pays off. The initial breakage was excellent, providing a sloping bank of broken rock for easy shovel digging and uninterrupted crushing and screening operations in the plant.

Achieving satisfactory results from primary blasts requires the selection and use of the right explosives materials and methods. For more than 40 years, Hercules has pioneered in the development of improved explosives techniques for quarrying, mining, seismic prospecting, and construction. A Hercules representative will welcome the opportunity to assist in solving your blasting problems.

HERCULES POWDER COMPANY
INCORPORATED
Explosives Department, 960 King St., Wilmington 99, Del.

Birmingham, Ala.; Chicago, Ill.; Duluth, Minn.; Hazleton, Pa.; Joplin, Mo.; Los Angeles, Calif.; New York, N. Y.; Pittsburgh, Pa.; Salt Lake City, Utah; San Francisco, Calif.

XR56-6



5-second rescue from motor burn-outs

with HYDRO-SHEAVE® Drive

Every time the temperature dropped, Stoneridge Limestone Company had a severe starting problem. Bringing their vibrating screens up to full speed under load—*with mechanical drive*—ate up 15 minutes before the cold bearings and belts loosened up. Production time was lost. But even worse, the unavoidable result was motor overheating from severe and prolonged starting loads . . . a condition pointing straight to motor burn-outs in a matter of time.

To solve the problem, Stoneridge called in their Authorized Twin Disc Hydraulic Dealer—Rockford Tool & Transmission Company.

The solution was quick and easy: Twin Disc HYDRO-SHEAVE Drives, slipped on the output shaft of motors powering the vibrating screens.

Results were immediate. The silken "slip" of *fluid* within the HYDRO-SHEAVES—*eliminating* mechanical connection—picked up the heavy starting load smoothly, automatically . . . permitting the motors to accelerate to normal rpm *within 5 seconds*, preventing overheating and inevitable burn-outs—and increasing production by eliminating the 15-minute warm-up period.

In addition, the cushioning effect of the HYDRO-SHEAVE Drives *absorbs* the shock loads, overloads, and vibrations inherent with the operation.

Whether you are driving equipment with motors or engines, if your installations are between ¾ and 850 hp you can *improve performance*—and obtain *positive protection*—with Twin Disc Fluid Drives. Write *today* to Twin Disc, Dept. DS, Racine for *new* Bulletin 144-D, giving *complete* description of the 10 different models of Twin Disc Fluid Drives—illustrating their wide variety of input, output combinations plus their ease of installation.

Twin Disc 10.6 HYDRO-SHEAVE Drives boost performance, protect motors and driven parts on 4′ x 10′ triple-deck vibrating screen (left) and 4′ x 12′ double-deck vibrating screen (right) at Stoneridge Limestone Company, Rochelle, Ill. HYDRO-SHEAVE is easily installed on either engines or motors. Capacities from ¾ to 50 hp.

TWIN DISC

TWIN DISC

Fluid Couplings

TWIN DISC CLUTCH COMPANY, Racine, Wisconsin (Hydraulic Division) Rockford, Illinois

Wire Rope at Work—This is a spot in the southeast coal fields, one where mighty mean digging conditions exist. Stripping is slowed by some frustrating sandrock formations. On this particular job, the big dragline excavator, with a capacity of 16 yd, was using only a 10½-yd bucket. That's how tough the digging had become.

A thick layer of overburden covered the coal. Rock or no rock, the overburden had to go. And go it did—with stout Bethlehem rope pulling and hoisting the bucket. This rugged wire rope was of course Purple Strand, Bethlehem's top grade. There was Purple Strand, too, on the shovel in the foreground. The ropes had been chosen with particular care, and even in the roughest kind of going, they easily weathered every stress.

Bethlehem Steel Company, Bethlehem, Pa. On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

Mill depots and distributors from coast to coast stock Bethlehem rope for the following industries and numerous others:

MINING • QUARRYING • CONSTRUCTION • EXCAVATING • PETROLEUM • LOGGING • MANUFACTURING

TISCO® MANGANESE STEEL wear parts keep down-time down in MARION SHOVELS

Used in wear parts subject to a combination of impact and abrasion, TISCO Manganese Steel is so long-lived that it minimizes costly down-time for maintenance. Ever since Taylor-Wharton pioneered in this tough, work-hardening material more than sixty years ago, it has remained unequalled in its resistance to these destructive forces. That is why it is used in MARION Power Shovels for Dipper Fronts and Teeth, Pinion Gears, Racks and Tread Links.

And TISCO Manganese Steel is only one of several useful alloys developed by this Company that are notable for resistance to wear in various forms. Prominent among them is TISCO 150-Y, which shows unusual durability against severe abrasion, where impact is not a factor. It is recommended for extrusion augers, scraper blades, agitator blades, mixer paddles and other applications subject to similar wear conditions.

Another very serviceable alloy is TISCO #50. It shows excellent resistance to abrasion and fair impact qualities. It is extensively used for ball and rod mill liners, bushings and other uses that have similar wear problems.

If you have an application subject to abrasion or impact, or a combination of both, get in touch with Taylor-Wharton.

Marion Dipper, showing front and teeth of Tisco Manganese Steel

Marion Power Shovel treads of Tisco Manganese Steel

Use TIMANG Weld Rods and Shapes for rebuilding and repairing worn parts made of Manganese Steel.

TAYLOR-WHARTON DIVISION

HARRISBURG STEEL CORPORATION

HIGH BRIDGE 3, NEW JERSEY

Birmingham, Ala. Chicago, Ill. Cincinnati, O. Easton, Pa. New York, N.Y.

For producers of Concrete Building Units, Pipe and Ready-Mixed Concrete

MARCH 1956

THE CONCRETE MANUFACTURER

A SPECIAL SECTION OF PIT AND QUARRY

Block and Ready-Mix Plants of Hormigon Cubano, S.A., Havana, Cuba. Its affiliates Also Operate Aggregates, Block, and Ready-Mix Plants.

ELEGANT *Eden Roc*

14 floors concreted with 'Incor' in 13 weeks

'INCOR' REDUCED CONSTRUCTION TIME BY 25%, SAVED $30,000 IN CONCRETING MIAMI BEACH'S NEWEST LUXURY HOTEL

● This year's big news in the wintertime vacation capital is luxurious new Eden Roc Hotel. Blending modern design with the warm beauty of the classical, this $10-million, 14-story, 401-room hotel embodies the utmost in comfort and luxury. Each room, furnished, represents a total cost of $29,000, said to be the highest in the world.

From tropical gardens to top of tower, tallest in Miami Beach, the Eden Roc is outstanding in every detail. Equally outstanding was the contractor's performance in completing this staunch, firesafe structure with its far-from-simple design in record time.

Drawing on many years' experience with concrete-frame erection, the Taylor Construction Company went onto a high-speed 'Incor' schedule on June 15th, topping the structure out September 14th—14 floors concreted in 13 weeks!

A total of 22,000 bbls. of 'Incor' 24-Hour Cement was used, and the Contractor estimates resulting savings of $30,000 on forms and 25% in construction time, with corresponding reduction in overhead costs.

Typical 'Incor'* performance, in a building as noteworthy for structural quality as it is for the elegance of its every external aspect.

*Reg. U.S. Pat. Off.

EDEN ROC HOTEL
HARRY MUFSON, President

Architect:
MORRIS LAPIDUS
New York—Miami Beach

Consulting & Structural Engineers:
H. J. ROSS & ASSOCIATES
Miami

General Contractor:
TAYLOR CONSTRUCTION CO.
Miami

Ready-Mix 'Incor' Concrete:
MAULE INDUSTRIES, INC.
Miami

LONE STAR CEMENTS COVER THE ENTIRE CONSTRUCTION FIELD

LONE STAR CEMENT CORPORATION

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LONE STAR CEMENT, WITH ITS SUBSIDIARIES, IS ONE OF THE WORLD'S LARGEST CEMENT PRODUCERS: 18 MODERN MILLS, 38,000,000 BARRELS ANNUAL CAPACITY

The new STANDARD OF PERFORMANCE

TRANSIT WESTINGHOUSE MIXERS

The new SYMBOL OF BUILT-IN QUALITY

NOW AVAILABLE—the 1956 line of precision-built Westinghouse Transit Mixers, with these *outstanding* features:

- *Exclusive,* patented, fully-enclosed gear drive for the drum—no chains, no exposed gears—less trouble—less maintenance.
- Self-aligning, ball-and-socket front end mounting *at the drum*—an exclusive feature that prevents misalignment of driving parts.
- Double-action mixing drum with deeper mixing blades, plus 6 auxiliary blades that produce a faster, more uniform mix.
- 2-speed transmission that permits perfect control over wide range of drum rotating speeds.
- New, handy swing-away chute for direct discharge into high forms, hoppers and buckets.
- Single drum reversing levers and throttle controls—at each end of the mixer.
- Plenty of power—properly placed, completely controlled, efficiently applied; Power-Take-Off, optional, available on all models.

Compare WESTINGHOUSE TRANSIT MIXERS—feature for feature—and you'll buy the new STANDARD OF MIXER PERFORMANCE!

• • •

WESTINGHOUSE TRANSIT MIXER DIVISION
LeTourneau-Westinghouse Co.
INDIANAPOLIS • INDIANA

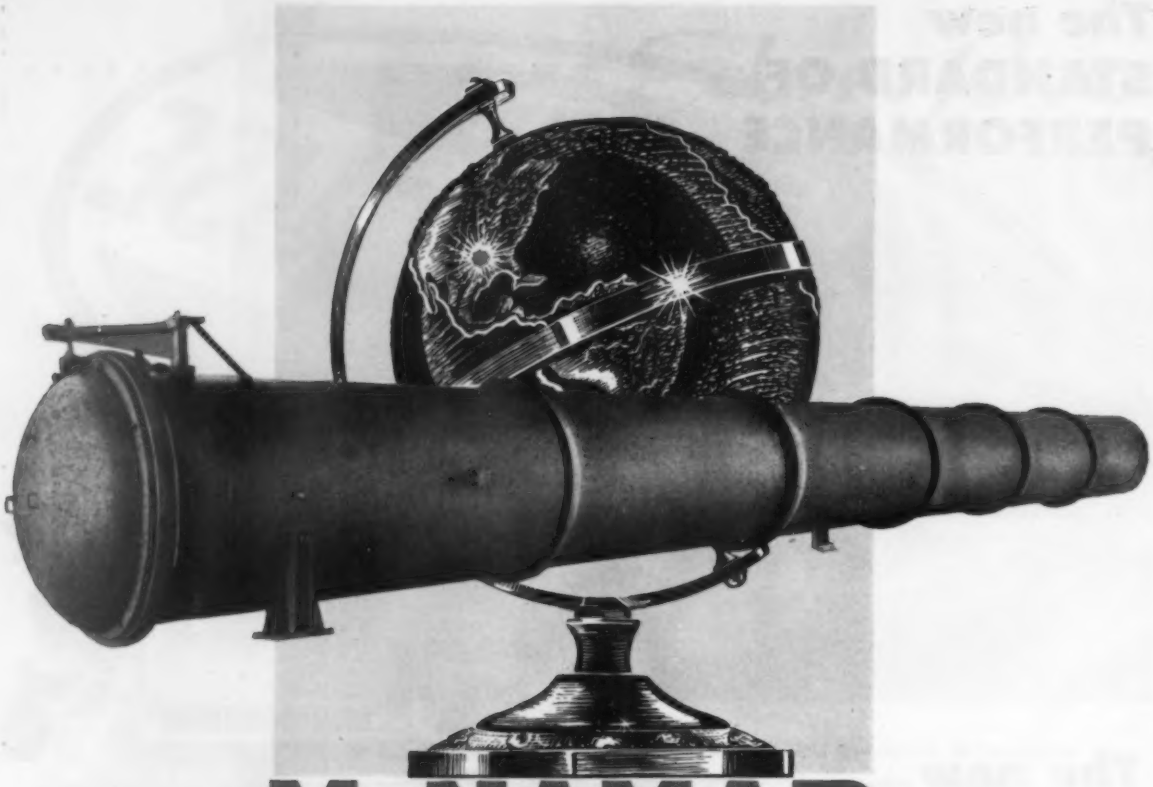
Get the complete story on the 1956 line of Westinghouse Transit Mixers, available in five sizes from 4½ to 6½ cubic yards. Write for Bulletin 256.

CLIP AND MAIL COUPON TODAY . . .

Westinghouse Transit Mixer Division,
LeTourneau-Westinghouse Co., Indianapolis, Indiana
Please send free illustrated booklet on the new Westinghouse Transit Mixer.

Name.....
(PLEASE PRINT)
Company.....
Address.....
City.....Zone.....State.....

CM-563



McNAMAR

WORLD'S LARGEST AUTOCLAVE MANUFACTURER

McNamar, the world's largest autoclave manufacturer now offers you one of the most economical autoclave plants available. Through many years of autoclave production McNamar is in a position to know your individual problems and to solve them. The engineering service includes fabrication and installation of your entire autoclave plant.

This all new McNamar autoclave is designed for the concrete production industry and combines the following features:

SCREW TYPE DOOR — Is as simple as a bolt and nut. The lock nut secures the door quickly and safely.

LONG GASKET LIFE — The door is designed for positive and identical alignment on each closure.

EASY SWING, OFF-CENTER DAVIT Reduces bridge length to 48″ or less.

SAFETY — Door meets all ASME code requirements. The door has underwriters approved safety interlock which prevents opening under pressure. 25 to 1 safety factor at 150 p.s.i.

Call, wire or write for additional information.

★ McNAMAR TULSA

McNAMAR
BOILER & TANK CO.
BOX 868 • PHONE CHerry 2-6291
TULSA, OKLAHOMA

The CONCRETE MANUFACTURER

March 1956

Glass Houses—and Thrown Stones

IT begins to look as though some of the alleged superiority of the glass-steel-aluminum "metal skin" building exteriors is to be disproved, in the light of recent reports of the Building Research Advisory Board of the National Academy of Sciences. Owners of 220 such structures—79 percent of which are less than five years old—report that a high percentage have been found lacking in the basic requirements of an enclosing wall.

These shortcomings include noticeable infiltration of air, water, snow, and dust; walls that are drafty, cold to the touch, and subject to vapor condensation on interior surfaces; corrosion, rusting, pitting, and etching on exterior surfaces; and grimy, streaked, permanently darkened or faded exteriors.

This is an indictment not unsuspected. In the scramble to develop a so-called "modern treatment" of building exteriors with new and startling effects, adequate consideration was evidently not given to the details of efficient installation, or to the use of proper materials.

Those of us who are interested in time-tested masonry materials may well examine the deficiencies of our materials and take steps to correct these, if we would avoid similar censure. Let us be realistic in our appraisal of the shortcomings, as well as of the superior attributes of our materials. We have a heritage of long experience to maintain. Progress denotes change; but in straining to produce something new, let it not be for the sake of newness alone, if the basic qualifications for an enclosing wall must suffer in the doing.

There is ample evidence that masonry materials lend themselves to curtain wall construction just as readily as other materials—and in many cases more efficiently. Economy, flexibility in design, adequate range of color and texture, strength, and fire protection are but a few of the inherent advantages that come to mind.

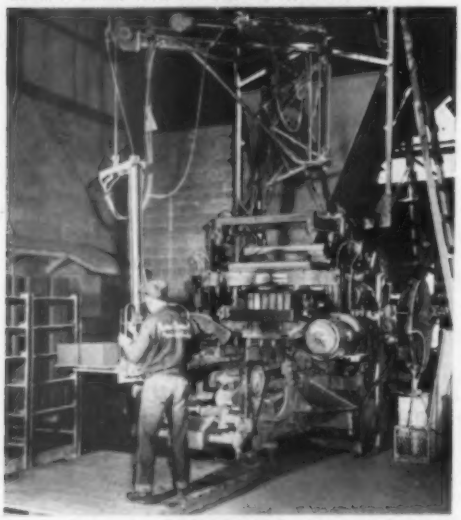
If the newer materials are portents of the future, as some would have us believe, let those adherents discover the pitfalls enroute to that goal. In the meantime let us watch our own paths. If we see that efficient construction practice is followed with masonry materials, our efforts should result in structures more than "skin deep" in beauty and more enduring than the "glass houses". If we cannot thus uphold our heritage and with the same materials supply new beauty in modern design, we have reached a plateau from which the road leads only downward.

Roy L. Peck

Another BESSER Booster*

*This is the 128th of a series of ads featuring leaders of the Concrete Products Industry who are stepping up block production with Besser Vibrapac machines.

Maine Cement Products Company officials (left to right): John W. Peavey, Office Mgr., Joe A. Thomas, Plant Supt., Edwin F. Smith, V. P., and Jess Storey, President.



Besser Vibrapac in the Portland plant. Front Pallet Feed Model. Fully automatic. Off-bearer merely guides the power hoist for removing green block to racks.

Three Maine Block Plants are 100% Vibrapac Equipped!

The Maine Cement Products Co., Inc. operates three concrete block plants — one at Portland, one at North Leeds and one at Bangor. All three plants are equipped with Besser Vibrapac machines.

Starting the manufacture of concrete block in 1949, the company chose Vibrapacs because of the long-lasting qualities of both the Vibrapacs and the end-product — Vibrapac block. In the words of President Storey, *"We consider Besser the only machine that can produce block to meet all specifications."*

Here is another example of a company that requires the finest and most dependable equipment to meet the ever-increasing demand for high quality block. And like so many other progressive block plants, they put their complete faith in Besser equipment.

BESSER COMPANY
BOX 131 • ALPENA, MICHIGAN, U. S. A.

Naturally, the company used Vibrapac Block for constructing their modern office building.

Portland yard and plant of Maine Cement Products Co., Inc.

NATIONAL HOUSING CENTER EXHIBIT — Besser Company maintains a permanent exhibit of concrete masonry in the new National Housing Center, Washington, D. C. Be sure to visit this fine display when you are in the nation's capital.

First in Concrete Block Machines!

BESSER VIBRAPAC

A 8658-1PBC

News of the Concrete Industries

Macy and Arthur Elected To Head Iowa Association Of Ready-Mix Producers

Nearly 150 members, associate members and other interested persons attended the eighth annual meeting of the Iowa Ready Mixed Concrete Association in Des Moines on January 26.

The following officers were elected for the current year: president, Howard Macy, Macy Brothers, Inc., Lynnville, Iowa; vice-president, Robert E. Arthur, Washington Concrete Company, Washington, Iowa; and secretary-treasurer, Kenneth Johnson, Ready Mix Concrete Company, Sioux City, Iowa. Directors chosen are Carl Brockman, Fort Madison Ready Mix Company, Fort Madison, Iowa; Albert Wiltgen, Wiltgen Ready Mix Company, LeMars, Iowa; and Don Hartkoff, Allied Engineering Company, Atlantic, Iowa.

Speakers included the following: Del Bloem, National Ready Mixed Concrete Association, Washington, D. C.; Dean S. G. Winter, State University of Iowa, Iowa City; and Robert Shiely, Shiely Ready Mix Company, St. Paul, Minn. An address which was to have been given by Bert Myers could not be presented; but a transcript of the text will be mailed to the members of the association.

Topics covered by the speakers were concrete specifications, the need for accounting in a ready-mix business, and an analysis of purchasing requirements. There was also an illustrated talk on tilt-up concrete construction.

Indiana Septic Tank Makers To Hold First Convention

At a meeting called by Purdue University and the Indiana State Board of Health last year in Indianapolis several septic tank producers organized the Indiana Septic Tank Manufacturers Association. The following officers were elected: president, R. L. Fifer, Louisville, Ky., and Evansville, Ind.; vice-president, F. M. Ivans, Graybill, Ind.; and secretary-treasurer, C. N. Mayden, Jeffersonville, Ind.

This organization will hold its first convention on the campus of Purdue University, Lafayette, Ind., on March 26 and 27. All septic tank manufacturers, master plumbers, state, county, and city health boards of this area are invited to attend the meeting.

Henry Buchholz Dies at 58 While Vacationing in Mexico

Henry Buchholz, 58, general manager of the Illinois Cement Block Company, Franklin Park and Blue Island, Ill., died of a heart seizure on February 3.

Mr. and Mrs. Buchholz were vacationing at Acapulco, Mexico, after the National Concrete Masonry Association convention when the fatal attack occurred.

Apparently in good health during the convention in New Orleans, Mr. Buchholz and his wife went on to Mexico to enjoy a winter vacation. He became ill while bathing at Revolcadero Beach at Acapulco.

Mr. Buchholz had helped organize the Illinois Cement Block Company before it became a subsidiary of the Illinois Brick and Block Company.

Coming Events

April 9, 10, 1956—Chicago. 14th annual meeting, Mid-West Ready-Mixed Concrete Association. Drake Hotel.

April 12-14, 1956—Denver. Sixth annual convention, American Concrete Agricultural Pipe Association. Brown Palace Hotel.

April 23-25, 1956—Detroit. 50th annual convention, Autoclave Building Products Association. Statler Hotel.

May 16-18, 1956—Hollywood, Fla. Second annual convention, Prestressed Concrete Institute. Hollywood Beach Hotel.

June 17-22, 1956—Atlantic City. 59th annual meeting and 12th apparatus exhibit. American Society for Testing Materials. Chalfonte-Haddon Hall.

Mo-Con Corp. Formed In Merger of Eight Plants Producing R.M.C. and Block

Organization of Mo-Con, Incorporated, a central Missouri company uniting the management functions of eight concrete plants, has been announced by Lon C. Ware Jr., president of Mexico Building Products Company of Mexico, Mo.

The new company will include Missouri plants which have operated independently as the Mexico Building Products Co. of Mexico, the Wentzville Concrete Company of Wentzville, the Economy Ready Mix Company of Wright City and Warrenton, the Montgomery Block Company of Montgomery City, the Vandalia Concrete Company of Vandalia, the Callaway Concrete Company of Fulton, and a new plant, to be located at Centralia.

Each of the individual plants will be renamed Mo-Con, Incorporated, of Mexico, etc. The home office will be maintained in Mexico.

Lon C. Ware Jr. of Mexico, Henry C. Goellner of Wentzville, Jack B. Riggle of Wright City, William B. Smith of Montgomery City and James H. Ware of Fulton are directors.

It was indicated that there will be no change in operations or personnel of the Mexico plant, except for the employment of additional workers required by the new corporation.

Big Autoclave at Crego Plant First Installed in N. Mexico

In Albuquerque, N. M., the Crego Block Company recently added a 127½- by 10-ft. autoclave to its block-making facilities. This is one of the largest high-pressure steam autoclaves of its kind in the industry, and the first in New Mexico.

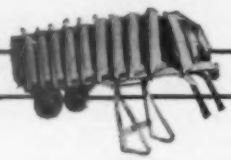
Built by the McNamara Boiler Company, Tulsa, Okla., the 65-ton unit was transported to Albuquerque on three flatcars. At its destination it was skidded onto two semi-trailer trucks for the trip to the plant site.

The big block-curing "tank" will accommodate 15 small flatcars loaded with concrete block. After the autoclave has been filled to capacity, the chamber is sealed and steam is applied at 150 p.s.i. The curing period is only 24 hours, compared with 28 days under the old method. Ben Crego owns the block plant.

TWIN-TILT TRUCKS CUT LABOR COSTS

TWIN-TILT TRUCKS with SWINGARD CONSERVE SPACE and CUT LABOR COSTS.

Built to turn on a dime and to operate with finger tip control, TWIN-TILT trucks allow one man to do the work of two. The SWINGARD safety feature of sturdy bar iron construction, protect both man and load from injury or damage. The guard swings completely out of the way when truck is moving the load, to safety position if truck is dropped, automatically catching and supporting the load.



UP TO 1200 LBS. WITH FINGER-TIP CONTROL.

TWIN-TILT is the only hand operated truck with the patented, labor saving auxiliary frame. It is of all metal construction with full welded frame, (no bolts or rivets to work loose). Engineered for maximum ease of operation, Twin-Tilt trucks require a minimum of space in turning or moving and lift up to 1200 lbs. palletized materials with finger tip control. The Swingard safety feature can be attached to any heavy duty hand truck.

For completely descriptive literature write.

TWIN-TILT TRUCK CO.
P. O. Box 11 St. Bernard
Cincinnati 17, Ohio

Detroit Concrete Producers Active on Improvement Board

Several prominent concrete producers are represented on the board of directors of the Concrete Improvement Board of Metropolitan Detroit, which held its annual meeting recently. Discussion of the new Detroit Building Code, to be presented to the city council for adoption, included approval of the sections applicable to concrete and concrete masonry construction.

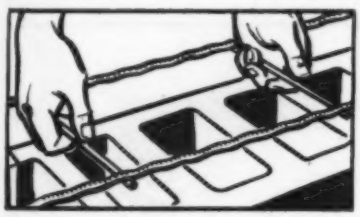
Chairman and directors elected at this meeting include the following: P. H. Rice, technical director, American Concrete Institute (chairman); C. A. Sirrine, executive secretary, Concrete Products Association of Michigan; W. G. Irmscher, Peerless Cement Corporation; R. S. Evans, American Aggregate Corporation; John Tucker, Ready Mix Concrete, Inc.; J. J. Gossom and M. E. Honderich, both of the Thomas E. Currie Company; R. L. Freeman, Huron Portland Cement Company.

A Tip: Lay Joint Reinforcing With the Cross Rods Down

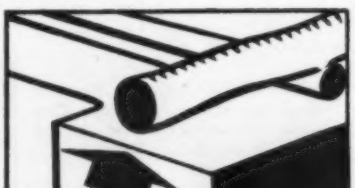
Horizontal mortar joint reinforcing for concrete masonry has become almost a must in modern practice. Yet in an effort to emphasize the high degree of bond strength which most systems attain with the mortar, and the strength of the reinforcing itself, some manufacturers of joint reinforcing have overlooked the way most masons lay the reinforcing in the joint. One such manufacturer recently had this point brought to his notice by architects and engineers, who had observed in practice that the mason usually lays the reinforcing on the last course of block and then spreads the mortar over the top.

In this case the side rods—which carry the greater proportion of the tensile stresses—rest right on the blocks, preventing the mortar from getting under the rods. The result is that there is little if any bonding between the mortar and the under side of the reinforcing. No matter how good the reinforcing may be, complete bonding to the mortar, to transfer the stress to the rods, is impossible of accomplishment.

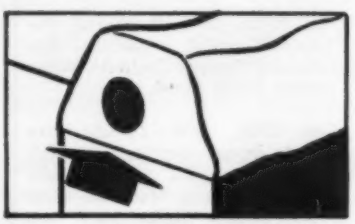
J. R. Briggs, vice-president of Adrian Peerless, Inc., Adrian, Mich., was the manufacturer who frankly admitted that he had been embarrassed in thus overlooking the way in which masons had misused their reinforcing. He suggests that his firm's Wal-Lok reinforcing should be placed with the cross rods down.



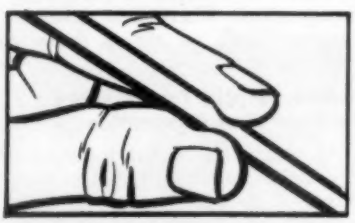
Place the reinforcing on the wall with the cross rods down.



The cross rods hold the side rods up, off the wall.



When mortar is applied, it completely surrounds the side rod—giving 100 percent bond.



For a positive grip on a rod, don't use finger tips.

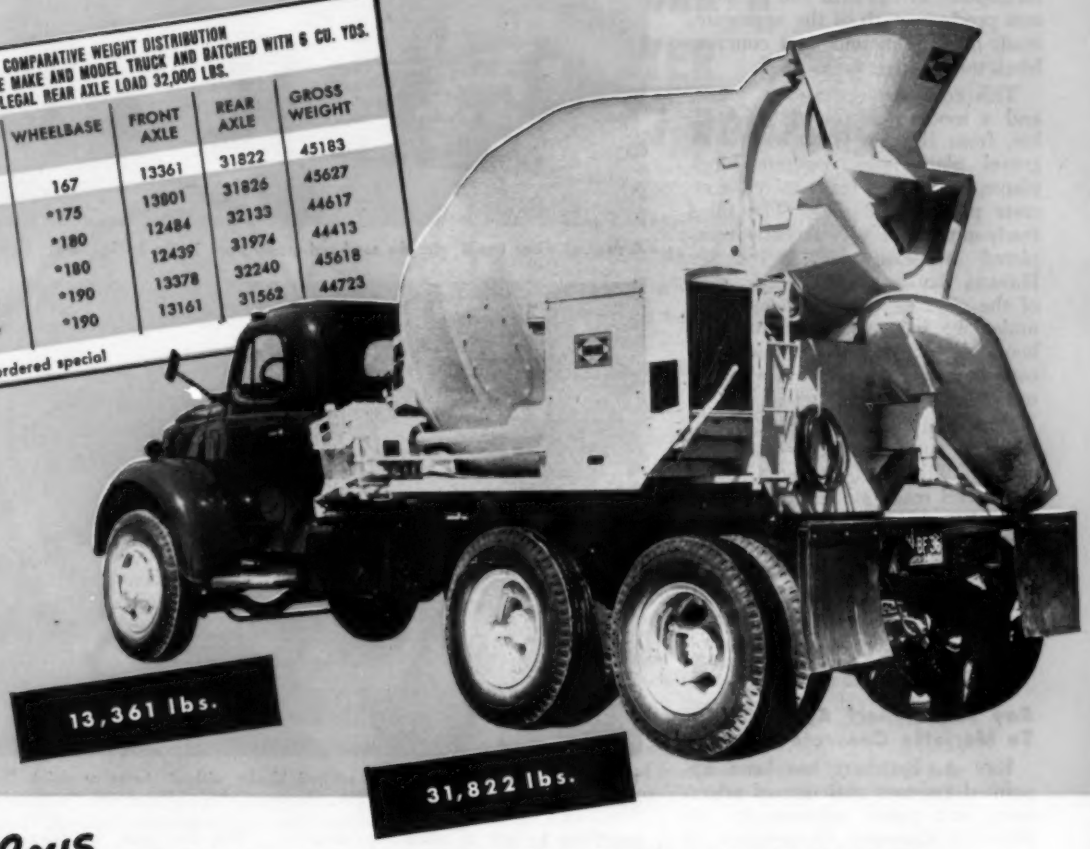
Grip it with the whole hand—with fingers wrapped all the way around.

Compare BLAW-KNOX TRUKMIXERS *with ordinary truck mixers for better weight distribution on* SHORTER WHEELBASE TRUCKS

COMPARATIVE WEIGHT DISTRIBUTION
ALL MIXERS ON SAME MAKE AND MODEL TRUCK AND BATCHED WITH 6 CU. YDS. LEGAL REAR AXLE LOAD 32,000 LBS.

LOAD ON THE ROAD	WHEELBASE	FRONT AXLE	REAR AXLE	GROSS WEIGHT
BLAW-KNOX	167	13361	31822	45183
MIXER "A"	*175	13801	31826	45627
MIXER "B"	*180	12484	32133	44617
MIXER "C"	*180	12439	31974	44413
MIXER "D"	*190	13378	32240	45618
MIXER "E"	*190	13161	31562	44723

*Must be ordered special



Hi-Boys mount on a more maneuverable, shorter wheelbase truck

WHEN YOU STUDY the table above you can see why Blaw-Knox Hi-Boy TRUKMIXERS can be mounted on shorter wheelbase trucks. Mounting the motor at the rear and the transmission at the end of the combination pedestal water tank, permits center of weight to be moved 20" forward and shortens the overall length. This gives better weight distribution with more weight on front axle so you can carry bigger *legal* payload.

Another Hi-Boy feature that assures better weight distribution and most efficient mixing is the larger diameter drum that mixes even zero slump concrete quickly and keeps the batch weight at the front of the mixer. Pedestal and flush water tanks are also combined to reduce weight by approximately half a ton and lower the center of gravity of the unit. There are dozens of other practical, profitable features in these units you will want to investigate. Call your Blaw-Knox distributor today.

BLAW-KNOX

BLAW-KNOX COMPANY

CONSTRUCTION EQUIPMENT DIVISION
Mattoon, Illinois

Affiliated Cuban Firms Spur Growth of Havana With Multiple Operations

The firm of Hormigon Prefundido, S.A., of Havana, Cuba, is an important factor in the growth of that metropolis, as this firm and its affiliates produce much of the aggregate, ready-mixed concrete, and concrete block used in that area.

This company operates a quarry and a modern processing plant 28 km. from Havana and a sand-and-gravel plant, two concrete block plants, and three ready-mixed concrete plants in Havana. The third ready-mix plant was recently completed in East Havana, across Havana Bay from the main section of the city. A tunnel is being built under the bay, and a construction boom is expected to follow. The company operates a fleet of 33 truck mixers and is adding more.

Hormigon Prefundido, S.A., manufactures concrete blocks—as does also its affiliated Hormigon Cubano, S.A.—and ready-mixed concrete—as does the affiliated Concretera Progreso, S.A., in East Havana.

Crushed stone is produced by Canteras de Hormigon Cubano, and sand and gravel by Industrios Hormigon Cubano, S.A. The plant of Hormigon Cubano, S.A., appears on the cover.

A fleet of mixer trucks, with the sand-and-gravel plant in the background.

This paper warehouse is built of colored blocks, without stucco or paint. The units were supplied by Hormigon Prefundido, S.A., Havana, Cuba, affiliated with Hormigon Cubano, S.A.

Ray A. Barnhart Appointed To Marietta Concrete Staff

Ray A. Barnhart has been appointed assistant manager of advertising and public relations for the Marietta Concrete Corporation, it has been announced by F. Leonard Christy, vice-president. In addition to his new duties, Mr. Barnhart will continue to act as sales representative in the Beslite Division of the company.

A 1950 Marietta College graduate, Mr. Barnhart attended the University of Houston. He was a member of the Marietta College faculty from September, 1951, to February, 1955.

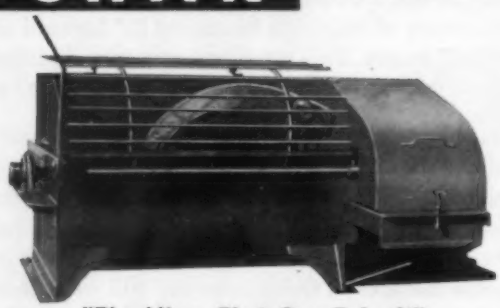
PRASCHAK **TWICE AS HEAVY AS THE PRICE!**

CAPACITIES:

8 cu. ft.	$635.00
16 cu. ft.	$840.00
21 cu. ft.	$945.00
30 cu. ft.	$1330.00
50 cu. ft.	$2530.00

(Prices Less Motor, Mount & Drive)

Compare the Mixer, not the price



"The Mixer That Can Take It"

CHECK THESE FEATURES:

- ✓ NiHard Blades
- ✓ Sectional Liners
- ✓ Full Size Ball Bearings
- ✓ Extra Heavy Drive Gears
- ✓ Extra Heavy Shafts
- ✓ Drive on Either Side

AVAILABLE FROM STOCK,

with Motor, Motor Mount, Drive completely assembled.

MORE AND MORE PRASCHAK MIXERS ARE BEING SOLD EVERY YEAR, TO THE LARGEST AS WELL AS THE SMALLER PLANTS. THERE MUST BE A REASON WHY THE PRASCHAK MIXER IS *AMERICA'S POPULAR MIXER!*

PRASCHAK MACHINE CO. MARSHFIELD, WIS.

DOW

BETTER CONCRETE FASTER WITH DOWFLAKE

When Dowflake is added, workability of concrete is improved, normal strength achieved faster, freezing hazard minimized.

Dowflake® (Dow calcium chloride, 77-80%) gives you stronger, better quality concrete every time, all year around. This ever-thirsty chemical assures you of stronger concrete at all ages—for example, a week after pouring it is nearly one-third stronger than plain concrete. Forms, equipment and men go on to other jobs sooner. And Dowflake makes concrete more workable. It flows faster. Needs less water. Uniformity of curing, uniformity of strength and many other advantages are yours with Dowflake.

You benefit from faster setting time. Plain concrete, without Dowflake, poured at 40°F. requires an average of 6¾ days to reach safe working strength. This same concrete *with* Dowflake needs only 2¾ days—a savings of four full days! At 32°F. Dowflake saves you 5¾ days—at 25°F. it's actually 35 days!

Save man-hours, save money, increase efficiency—and get a stronger, better quality concrete faster with Dowflake. Dowflake can be added at the plant or to the mixed concrete in the truck shortly before discharge. Available in 25-pound and 100-pound moistureproof bags. Write THE DOW CHEMICAL COMPANY, Midland, Michigan, Dept. IN 781R.

(TOP) The 25-pound bag is an accurate measuring unit. Add one bag to a five-yard batch to obtain a 1% Dowflake mixture. Two bags for 2%. Mix thoroughly. Easy as that—and no chance for error, no awkward bucket measures.

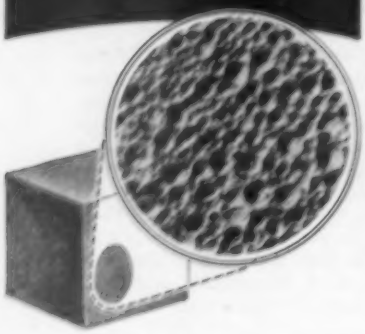
(CENTER) Concrete flows faster, is more workable and produces a greater strength gain when it contains 1 to 2% Dowflake.

(BOTTOM) Your assurance of better concrete work every time is Dowflake!

you can depend on DOW CHEMICALS

DOW

Introducing
Elastizell
. . . a basis for making
LIGHT WEIGHT, STRONG,
INSULATING concretes
from universally
available materials



what can YOU do
with this product
of many uses?

ELASTIZELL-TYPE
CONCRETE "PLUSSES" . . .

- LIGHT WEIGHT . . . big savings in handling and design
- STRONG . . . strengths for structural applications
- MOISTURE-RESISTANT . . . cork tile on grade
- SELF-INSULATING . . . comfort on grade
- POSITIVE DENSITY CONTROL . . . results as predetermined
- HOMOGENEOUS STRUCTURE . . . uniform strength and insulation

Write, wire or 'phone . . .

ELASTIZELL CORPORATION OF AMERICA
158 FLETCHER STREET • ALPENA, MICHIGAN
'PHONE 1080

Interesting Effects Obtained By Shadowal Concrete Units

A new concrete masonry unit called Shadowal block was introduced at the 36th Annual Convention of the National Concrete Masonry Association in New Orleans, according to announcement made by William P. Markert, N.C.M.A. promotion director.

Shadowal masonry, which is an adaptation of the standard modular concrete masonry unit, involves the incorporation of a ⅝-in. recess in either triangular or rectangular shape on the face of the concrete masonry unit.

By using various forms of bonding an almost limitless variation of geometric patterns can be made with Shadowal block. Pattern dimensions of the modular block are: 3 13/16 in. from the top of the recess to the outer edge of the block or 4 in. from the top of the recess to the middle of the mortar joint.

A patent has been applied for Shadowal block and assigned to the National Concrete Masonry Association. Block machine manufacturers will be able to furnish attachments for the machines to members of N.C.M.A. Initial investigation indicates that association members will be able to produce Shadowal units at a nominal cost. Shadowal block will be available only from members of N.C.M.A.

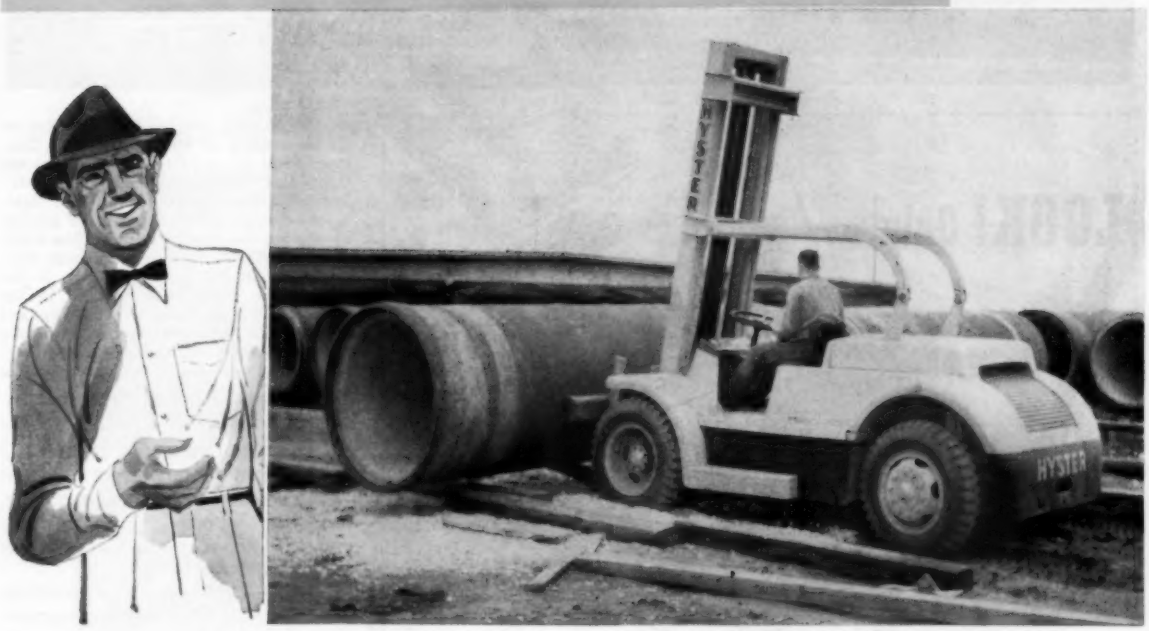
Extensive development and research is now taking place to perfect the manufacture of Shadowal block, and information will be sent to N.C.M.A. members as soon as it is available. It is estimated that the concrete masonry industry will be able to supply Shadowal units to the building industry early this summer.

In the top illustration the blocks are laid in conventional bond, the recesses at the ends of the unit forming an attractive motif of triangles in the architectural frieze. Right: Blocks are laid in vertical stacked bond to form a pattern of horizontal diamonds.

In the illustration at the left blocks having only one end recess formed into the face are butted in horizontal bond, forming a pleasing effect with vertical diamonds.

HYSTER INDUSTRIAL TRUCKS MOVE MATERIALS *FASTER!*

at Greater PROFIT to You



"King of Lift Trucks" the RC-150 handling concrete pipe 48 inches in diameter, 16 feet long and weighing 11,250 pounds. Working under very adverse ground conditions.

Pictured above is one of many typical examples of how Hyster® Industrial Trucks are helping to effect tremendous savings in the cost of handling Concrete Products.

Even if you are now using lift trucks or have never used industrial trucks of any kind, your Hyster dealer can show you how you can quickly realize more profit from your operation with these multi-purpose utility tools. Your Hyster dealer knows materials handling . . . he is an expert on the problems and their solution. He can help you with special techniques and cost reducing methods. Call him today...why not take advantage of his materials handling know-how?

HYSTER DEALERS GIVE YOU ALL 3!

1 **PLANNING** — your Hyster Dealer will plan your materials handling operation from scratch, or will analyze your present system to see if it can be improved.

2 **THE RIGHT TRUCK** — for *your* job from Hyster's complete line of industrial trucks (1,000-30,000 lbs.) and over 100 job-attachments.

3 **THE RIGHT SERVICE** — ample spare parts stock, shop facilities, factory-trained mechanics and an efficient field service that keep your Hyster lift trucks going on your job, wherever your job might be located. Hyster trucks are noted the world over for their low downtime.

Materials Handling Trucks from 1,000 to 30,000 pound capacities

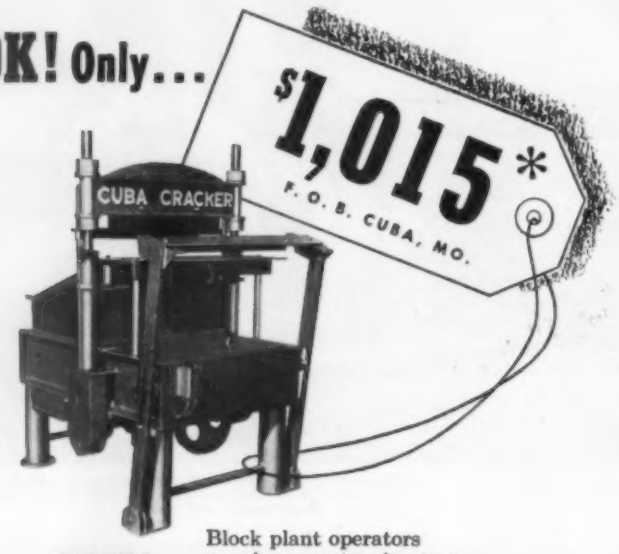
2926 N. E. CLACKAMAS, PORTLAND 8, OREGON
1026 MYERS STREET.....DANVILLE, ILLINOIS
HYSTER N.V.....NIJMEGEN, THE NETHERLANDS
FOUR FACTORIES: Portland, Oregon; Danville, Illinois; Peoria, Illinois; Nijmegen, The Netherlands.

HYSTER

HYSTER COMPANY

● The recently erected Personnel Record Center Building, St. Louis County, Mo. Construction of this building, supervised by the U.S. Corps of Engineers, Kansas City, Mo., District, utilized a half-million 8-in. lightweight concrete blocks, exposed and painted on interior and exterior surfaces. The building has 1,300,000 sq. ft. of floorspace, making it one of the largest buildings in this country. The blocks were furnished by the Majestic Building Material Company and the Haydite aggregate by the Hydraulic Press Brick Company, both of St. Louis, Mo.

LOOK! Only...



...opens a new road to new profits for you!

Block plant operators everywhere are turning to a *new* horizon of greater profit . . . *split block* . . . easily produced on the CUBA CRACKER in a wide variety of eye-appealing and permanent colors. If you want *your* share of this profitable market, then the new, rugged CUBA CRACKER block splitter is for you. Accommodates block slabs up to 24" wide, 8" high. Because of its simple, cam-principle design, the CUBA CRACKER is priced from $500 to $1,000 *less* than other comparable machines. Mechanically powered, it is shipped complete—ready to operate. Immediate delivery. Write for full information today!

*$1,385 with Automatic Feed...

MAIL TODAY!

FLEMING

MANUFACTURING CO.
489 FLEMING AVE.
CUBA, MO.
PHONE: CUBA 400

Gentlemen: Please rush complete information, including specifications, prices and terms on the low-priced CUBA CRACKER block splitter.
Also request information on:

- ☐ Automatic Double Block Machine
- ☐ FMC-180 Fully Automatic Concrete Block Machine
- ☐ FMC Stationary Mixers

Name_____
Firm_____
Address_____
City_____ Zone_____ State_____

Pennsylvania Block Producer Sustains $10,000 Fire Loss

Damage estimated at about $10,000 resulted recently from a fire at Minder's Block Plant, Quarryville, Pa. It was reported that the fire was confined to the main block-making section of the plant.

Intense heat within the building burned away the wooden supports and caused the metal roof to collapse. No one was in the damaged area, which contained block machinery and finished blocks, at the time of the fire.

W. J. Brull Named to Post On Minnesota Firm's Staff

William J. Brull was recently named vice-president and general manager of the Zenith Concrete Products Company, Duluth, Minn. He will direct the production of the firm's line of concrete block, structural concrete, tile, and brick.

Mr. Brull was formerly vice-president and assistant general manager of the Northwest Concrete Products Company of St. Cloud, Minn. He is the immediate past-president of the Minnesota Concrete Products Assn.

Harry W. Easterly Jr., executive vice-president and general manager of the Concrete Pipe and Products Company, Richmond, Va., was presented the 1955 distinguished service award of the Richmond Junior Chamber of Commerce for "outstanding civic service to the community".

FORT WORTH SAND AND GRAVEL CO. V. P. CHARGE OF SALES, GEO. A. MEIHAUS, SAYS:

"Radio saves us $10.00 a day per truck"

Mixer driver Alvin E. Hobbs has just received instructions to proceed directly to his next job without going back to plant.

From his mobile repair van J. A. Markham talks directly to drivers, often diagnoses trouble so driver himself can make emergency repairs.

Chief radio dispatcher Coy Anderson gives instructions to a driver miles away.

READY MIX OPERATORS:

HERE IS CONSTANT CONTROL OF 51 TRUCKS OPERATING BETWEEN 5 PLANTS

Diverting trucks as needed to handle the output of five separate mixing plants was a king-size job. But Motorola 2-way radio has reduced it to everyday routine for the Fort Worth Sand and Gravel Co. of Texas.

Constant radio control—every minute of the day—of every one of the 51 mixers has resulted in a *saving* of about 20% in mileage per yard of delivered concrete. Drivers get their new orders *at the job-site*, and usually go *directly* to the next job without needless travel. Radio actually gets an *extra hour* of bonus production daily from every truck.

Besides speeding delivery and giving better customer service, Motorola 2-way radio has cut costs many other ways. Overtime of drivers and batch plant personnel has been slashed at Fort Worth. Telephone "hunting" by drivers has ended . . . reports are sent and orders received right in the cab. One radio equipped service van does the work of two . . . speeding repair and cutting down-time.

Five supervisors, out most of the time in their radio equipped cars, have instant contact with the main office. Meihaus says his company wouldn't be without 2-way radio now.

Find out how Motorola 2-way radio can pay for itself quickly by cutting costs for *you*, and go on to earn extra profits month after month. A Motorola Engineer will show you how. Write, phone or wire—TODAY!

MOTOROLA

2-WAY READY MIX RADIO

MOTOROLA COMMUNICATIONS & ELECTRONICS, INC.
A SUBSIDIARY OF MOTOROLA, INC.
4501 AUGUSTA BOULEVARD • CHICAGO 51, ILLINOIS
ROGERS MAJESTIC ELECTRONICS LTD. TORONTO, CANADA

Motorola consistently supplies more mobile and portable radio than all others combined.
Proof of acceptance, experience and quality.
The only COMPLETE radio communications service—specialized engineering . . . product . . . customer service . . . parts . . . installation . . . maintenance . . . finance . . . lease.
"The best costs you less—specify Motorola."

COMMENT
from the
BUTLER ENGINEER
. . . Of a Giant, Whiskers and Successful Bids

Your Butler engineer has now dealt with the ultimate — the pinnacle — the Mt. Everest of complexity in materials handling and plant design. Did I say "plant"? I meant multiple plants. It's a gigantic layout. On my preliminary scale drawings a line of 10 freight cars looked small as 10 whisker bristles from a morning shave. It's a huge ready mixed concrete deal; they sell sand, gravel and other aggregates, and they also have a large asphalt operation. Materials come in and ship out by train, by barge and by truck. And conveyors had to be designed to switch from barge to truck and again to train from the enormous stock piles. In several instances conveyors had to be reversible on exactly the same plane.

The entire yard is a network of rail lines and sidings, yet we were able to plan all truck routes without crossing any tracks . . . Have you ever seen a complicated wiring diagram? That's about what our drawings resembled.

But we're all proud to have been consulted and we're doubly proud our plans and recommendations are accepted. We feel that it is not only a feather in our cap; we think it represents more feathers than are in an Indian war bonnet.

•

Roadbuilders have a cheerful fact to deal with since the development of the Butler *Automatic* Roadbuilders Plant. As you may know, it batches sand, cement and two sizes of stone *with only one operator.* (Suggest you write for Bulletin describing it) . . . The cheerful fact? A contractor with this plant can successfully bid any paving job he wants, and make a bigger profit.

That's a *concrete* fact.

Yours faithfully,

The Butler Engineer

BUTLER BIN COMPANY
WAUKESHA, WISCONSIN

N.Y. Coal Sales Co. Division Turning Out Ready-Mix At 200 Yd./Hr. at Ironton

Production at the newly erected ready-mix plant of Basic Construction Materials Division, New York Coal Company, at Ironton, Ohio, is presently at the rate of about 200 cu. yd. per hour. Located on the Norfolk & Western Railroad, the plant receives its coarse aggregate by rail from the firm's Plum Run Stone Division plant at Peebles, Ohio. Cement shipments are received by rail or truck.

Aggregate is unloaded by an unloading conveyor which discharges into the hopper of a powered radial stacker, which can handle approximately 4,000 tons for storage. A ¾-cu. yd. Northwest Model 25 clamshell is used to select materials from storage piles and load them into a hopper at the bottom of a 24-in. inclined conveyor going to the turnhead at the top of the plant.

A unique feature of this plant is the arrangement by which it is possible to dry-batch dump trucks for pavers and also fill ready-mix trucks without making any changeover in the plant setup. It makes no difference in what sequence the trucks line up to be charged.

Bin and cement facilities were manufactured by the Butler Bin Company, and the conveyor system was made by the Columbus Conveyor Company, Columbus, Ohio. The charging hopper has a capacity of 5 cu. yd. All the conveyors can be operated from the plant or in the area of the stacker conveyor. The Ironton plant is equipped for night operation.

Other ready-mix plants operated by the Basic Construction Materials Division are located at Circleville, Chillicothe, Waverly, and Sargents, Ohio. The division also has a concrete block operation and a sand and gravel plant at Chillicothe. Approximately 2,000,000 concrete and lightweight blocks are produced annually. Chillicothe and Circleville plants, in addition, handle a full line of building materials.

Northwest Lift-Slab Co. Announces New Headquarters

Headquarters of the Northwest Lift-Slab Company, Inc., were recently moved from Spokane, Wash., to Portland, Oreg. It is reportedly the only firm in the Northwest specializing in lift-slab production, and is licensed for the Youtz-Slick lift-slab process.

Eric H. Hayford, formerly plant manager and sales engineer for Lay-Rite Concrete Products Company, Spokane, is president of the company. At one time he was also associated with the Warren Concrete Products Company of Spokane as construction superintendent.

R. Maxwell of Spokane is vice-president of the concern, and James Maguire is secretary-treasurer. Mr. Maguire will be in charge of the original operation in Spokane.

Left: The radial stacker at Ironton, receiving aggregates via an unloading conveyor from the track hopper. This setup will handle 4,000 tons for storage. The crane and conveyor in the background take the materials to the plant bin.

Right: The unloading conveyor from the reclaiming tunnel (left) takes aggregates to the swinging spout serving the 4-compartment bin. The cement storage silo and elevator are to the right of the bin.

Manufacturers of N.C.M.A. Name Gene Olsen Chairman of Division

The annual meeting of the Manufacturers' Division of the National Concrete Masonry Association was held on January 22, 1956, at the Roosevelt Hotel, New Orleans, La., with K. P. Kerr, Butler Bin Co., chairman, presiding.

In addition to the members of the division, the following also attended the meeting: Carl Smithwick, retiring president, National Concrete Masonry Association; Earl Petersen, N.C.M.A. president; E. W. Dienhart, executive secretary, N.C.M.A.; and William Markert, director of promotion for N.C.M.A.

Election results were as follows: chairman: Eugene F. Olsen, Gene Olsen Corporation; vice-chairmen: George Erickson Jr., Erickson Power Lift Trucks; R. P. McKenrick, Blaw-Knox Company; Dan Urban, Kent Machine Company; and Ken Becker, Cleveland Vibrator Company.

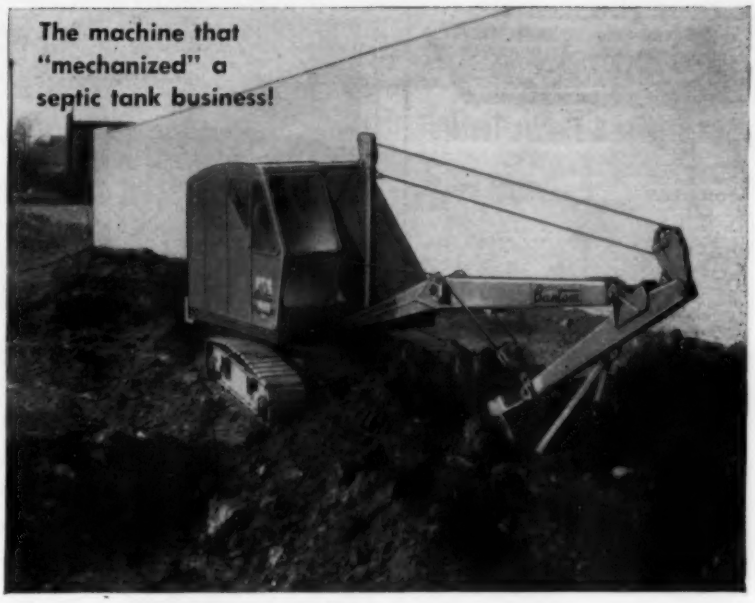
The following directors were named: Haakon Paulson, Besser Manufacturing Company; M. F. Ledford, Stearns Manufacturing Company; Richard Stickel, White Motor Company; Paul Klemens, Columbia Machine Company; Bob Smith, T. L. Smith Company; Warren Holden, Construction Machinery Company; Otis Manchester, Fleming Manufacturing Company; and Verne Andrews, Master Builders Company. Mr. Kerr, retiring chairman, will also serve as a director.

Richard J. Frazier Appointed To Anchor Products Staff

The appointment of Richard J. Frazier as production manager of Anchor Concrete Products Inc., was announced recently by Frederick W. Reinhold, president. Mr. Frazier also will be in charge of Anchor Concrete's expanded research, new-product development, and quality-control programs.

Mr. Frazier has been plant manager and research and development engineer for the Washington (D.C.) Brick Company.

At an expenditure of $175,000 the Richter Concrete Corporation of Covington, Ky., will soon erect its tenth ready-mixed concrete plant. The site is a 160-acre tract. Completion of the plant is expected in April, when Richter is scheduled to begin producing 150 cu. yd. of ready-mix per day. This output will bring the corporation's total production to 3,000 cu. yd. daily.



19 BANTAMS
help build million-dollar business!

That's the success story of M. S. Eisenhart, York, Pennsylvania. In business only 8 years, his big expansion started 5 years ago with one BANTAM replacing slower, costlier digging and installing methods. Since then he's added a fleet of 19 BANTAM back hoes, both carrier and crawler mounted, for his busy schedule of trenching and excavating operations in a 5-state area. He reports: "My operators claim that they are the finest ⅜-yd. machines when it comes to speed, ease and operation."

BANTAM Method Cuts Digging and Handling Costs

BANTAM makes quick work of all digging and handling jobs with its fast cycle . . . makes the work easy for the operator with simplified mechanical controls. Nine easy-change BANTAM-built attachments equip you for high-speed handling of any job you have.

Helping keep profits higher is a BANTAM specialty—requiring far less maintenance, BANTAM spends more time working and earning. It's true in this case and with all the thousands of BANTAMS in digging, handling and yard work everywhere!

Get all the money-saving facts on the ⅜-yd., 6- and 7-ton BANTAM. Mail the handy coupon.

World's Largest Producer of Truck Cranes and Excavators

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Please send me full information on the BANTAM:
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● These Sakrete manufacturers were among those attending the industry's recent annual meeting at Key Biscayne, Miami, Fla. Front row, left to right: Fayette Cloud, W. R. Bonsal Company, Lilesville, N. C.; A. C. Avril, president, Sakrete, Inc., Cincinnati; Guy Campbell, The Harry T. Campbell Sons' Corporation, Towson, Md.; and J. C. Stewart, Texas Dry Concrete Company, Fort Worth, Tex.
Back row, left to right: Hans Rexach, San Juan, Puerto Rico; Joseph Lambert, Twin City Concrete Products Company, Minneapolis, Minn.; J. D. Stewart, Mill Creek Transit Mix, Inc., Salt Lake City, Utah; W. E. Mussett, Dry Mix Concrete Company, Franklin Park, Ill.; and Charles Cerovski, Cerovski Cement Products, Inc., Lewiston, Mont.

Lebanon R.M.C. Plant Sold To Millard Lime & Stone Co.

Purchase of the Lebanon Ready Mixed Concrete Company's ready-mix operation at Lebanon, Pa., by the H. E. Millard Lime and Stone Company, Annville, Pa., was announced recently. According to E. D. Williams Sr., president of Millard, the building, mixing and storage bins, and other equipment will be dismantled and moved to the new owner's operation in Annville.

Roy H. Risser, owner of Lebanon Ready Mixed Concrete, stated that he will continue to operate the building materials business of the firm at its present location. He added that this operation will soon be given a new name.

Spancrete Method Extrudes "Ribbon" Concrete Planks

In Waukesha, Wis., the West Allis Concrete Products Company is turning out concrete planks by a process similar to the familiar toothpaste tube method. Recently introduced from Germany, the process called Spancrete, makes it possible to extrude up to 4½ linear feet per minute of prestressed roof and floor panels. The slabs resulting from the continuous casting can be produced in widths of 20 or 40 in. and in thicknesses of 4, 6, or 8 in.

By the Spancrete method a continuous plank 330 ft. long can be cast by means of a slip form built into a crane which spans the casting beds. This machine can be spotted to place the concrete to the desired thickness on any one of six parallel casting lanes. After the six passes, the device can repeat the operation, casting the second layer of concrete on the first.

Tests indicate that surface concrete containing 800 lb. of cement per cu. yd. attains a strength of 4,000 p.s.i. in 5 days and goes well over 7,000 p.s.i. in 28 days. Dead weight of the panels is kept to the minimum by hollow-core construction and use of some lightweight concrete. Dimensional accuracy reportedly has attained plus-or-minus 1/16 in.

Fire Causes $150,000 Loss At Marietta Concrete Plant

Damage estimated as high as $150,000 was caused by a fire which recently swept through Plant No. 2 of the Marietta Concrete Corporation at Marietta, Ohio. It is believed to have been caused by a short circuit.

According to Leonard Christy, Marietta's vice-president, the main loss was confined to light machinery, installation material, five trucks, and automobile tires. As firemen and volunteers managed to save valuable machinery, production at the plant will be resumed much earlier than was at first supposed possible.

Central Pre-Mix Concrete Company officials at Spokane, Wash., recently announced that the firm will purchase new equipment, including six trucks, two trailers, and two transit mixers, at a total cost of $70,000.

MOISTURE-PROOFING ADDITIVE

for concrete and cement materials

Now you can moisture-proof your concrete products by the simple addition of a small amount of LOSORB to the mix. The photograph above shows clearly the amazing effectiveness of Losorb. The blocks are identical except for the Losorb—water was poured on both simultaneously—and the picture shows the imperviousness of the treated block.

With this treatment you can produce water-tight concrete blocks with which to build walls so impervious that they can be painted inside without danger of blistering and peeling due to passage of moisture through the concrete. Losorb materially reduces the cost of providing water-tight building exteriors, and eliminates the need for any other waterproofing above grade.

In addition, Losorb makes the mix more plastic, homogeneous and easy to work, acts as a lubricant in the moulding operations, and minimizes cracks.

Losorb is easy to use—simply add a small percentage (2% to 4%) to the mix. No other change in processing is necessary to give your blocks the decided advantage of *waterproof!*

Pennsylvania Industrial Chemical Corp.
Clairton, Pennsylvania

Plants at:
Clairton, Pa.; West Elizabeth, Pa.; and Chester, Pa.
Sales Offices
New York, Detroit, Chicago, Boston, Los Angeles
Philadelphia, Pittsburgh, Cincinnati

PENNSYLVANIA INDUSTRIAL CHEMICAL CORP. (CM)
Clairton, Penna.

Please send me information on LOSORB.

Name_____
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A New

FORM OIL

ALOX 436

New Concrete Form Lubricant Improves Quality of Product . . . Decreases Handling and Maintenance Costs for Forms

- **Blends with light fuel oil or Kerosene.**
- **Prevents Sticking.**
- **Gives Smoother Finish.**
- **No Discoloration.**
- **Always Uniform.**
- **Never Rancid.**
- **Protects Forms From Rust or Corrosion.**

Alox 436 when added to kerosene or light petroleum oils makes a highly effective release compound that prevents concrete from sticking to molds or forms. It can be applied by brushing or spraying. After you have once tried Alox 436, you will never be satified with any other material. Use handy coupon below for additional information and sample.

Gentlemen:

We use_____gallons of form oil per year and would like a sample of Alox 436 to test. Also please send instructions for using.

NAME_____

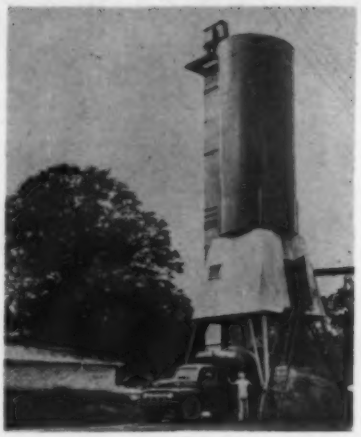
COMPANY_____

ADDRESS _____

CITY_____ ZONE_____

STATE_____

ALOX CORPORATION
3960 Buffalo Avenue
Niagara Falls, N. Y.



Both truck mixers and a block plant (right) are served by this one BCPC-600 bbl. cement bin. The idea of a bin serving two purposes was worked out jointly by the owners, Thomasville Concrete Products Company, Thomasville, Ga., Contractors Equipment Company, Atlanta, and Blaw-Knox engineers.

600-Bbl. Cement Bin Serves R.M.C. and Block Facilities

Modification of a standard cement bin to serve two separate operations has resulted in increased production and economies at the Thomasville Concrete Products Company, Thomasville, Ga.

The single Blaw-Knox BCPC-600-bbl. cement bin has been serving the concrete block plant and also the batch trucks and truck mixers since August, 1955. The idea of adapting the bin to serve a dual purpose was developed jointly by the concrete company, Contractors Equipment Company of Atlanta, Ga., and Blaw-Knox engineers. R. E. Willis, general manager and partner of the firm, says, "The installation works perfectly, and we haven't a complaint in the world."

The modification to the standard bin was relatively simple. Discharge of weighed batches into batch trucks or truck-mixers is accomplished in the conventional manner. To move cement to the adjacent block plant, it was necessary to cut an oblong hole in the cone-shaped hopper section of the bin, and a 36-in. collar was fastened to this opening. Attached to the discharge end of the collar is a 9-in. diameter 28½-ft. long screw conveyor. The screw empties into a Blaw-Knox hopper for automatic weighing of batches for the block plant.

In order to regulate the flow of cement to the block plant, two sets of baffles were installed. One set is located in the downspout, forming a throat to the screw, thus regulating the gravity flow of cement. The second baffle is circular in shape and is mounted inside the screw conveyor housing. This device prevents clogging and packing in the screw conveyor housing.

To allow for future growth, this main bin was placed so that a 400-bbl. auxiliary bin can be attached without disrupting operations or relocating any machinery or buildings.

New Lightweight Concrete Offered by Elastizell Corp.

Elastizell Corporation of America, Alpena, Mich., has announced a lightweight concrete described as highly moisture-resistant and self-insulating. According to company spokesmen, the material's low moisture-absorption factor—as low as 2 percent by weight—permits the use of any type of floor covering with it.

Elastizell, the chemical process which is used in preparing this new concrete, came to the attention of Lt. Karl O. Munninger (Navy) while he was supervising post-war naval construction at Bremerhaven, Germany. He brought it to the attention of concrete interests in the United States, and the corporation was organized two years ago to conduct research into its possibilities. Lt. Munninger is now a vice-president of Elastizell Corporation of America.

The new type of concrete has had widespread usage in West Germany, where more than 50,000,000 sq. ft. has been placed as insulating floor and roof fill in the last five years. In Alpena it has been used as slab flooring on grade and foundations in a colony of contemporary concrete-and-steel homes, reportedly with excellent results.

From these test installations, it is thought that Elastizell-type concrete can be utilized to provide lightweight floor fill in multi-story structures to save 15 lb. per sq. ft. of floor space, compared with the weight of ordinary concrete.

The 1956 edition of the *Directory of the American Council of Independent Laboratories, Inc.*, recently released by this organization, contains scope sheets for the 67 member laboratories which provide details and an extensive index of facilities and services. Copies of the directory may be obtained free of charge upon application to H. M. Dudley, executive secretary, American Council of Independent Laboratories, Inc., 4302 East-West Highway, Washington 14, D. C.

R/ Ready Mix

By Harry F. Thomson

Cement Types and Blends Deserve Consideration

IT has been stated often that a competent ready-mix producer should equip himself to be one of the best informed men in his community regarding the characteristics of concrete. He should be recognized as an exponent of good practices in obtaining economical quality concrete in unusual as well as routine projects. He should be able to consult with not only the contractor but also the engineer and architect, as to suitable mixes and methods.

It may be desirable to use something other than straight regular (Type I) cement as the cementitious material. So a good producer should be familiar with the effects of such influences as heat, freezing, sewage, acid waters, etc., on available mix materials. The following brief report on a series of impartial tests with several cements and cement blends under various conditions, indicates guides for some construction practices.

A short time ago discussions between material men and engineers of several public agencies in Chicago, Ill., resulted in the organization of a Conference Committee on Concrete Tests under the sponsorship of the city's Engineering Board of Review. The public agencies represented included the Sanitary District, the Bureau of Engineering (responsible for construction of subways and expressways), Bureau of Streets, Bureau of Sewers, Department of Purchases, Park District, and Cook County Highway Department. Private agencies represented included manufacturers of ready-mixed concrete, portland and natural cement, fly ash, air-entraining agents; also a commercial testing laboratory and the Portland Cement Association. A total of 36 men served on the committee in either active or advisory status. The elected chairman was W. T. McClenahan, principal construction engineer of the Sanitary District, well known for his interest in obtaining quality construction, especially in sewers and treatment plants. The principal financing to cover the cost of the tests came from an allotment by the Engineering Board of Review; voluntary contributions were also made by several of the private agencies.

Two groups of strength tests were conducted. In the first group, designated as W-Series, concrete specimens mixed with the selected cements or blends of cementitious materials were made both with and without purposeful air-entrainment; all curing was under standard 70 deg. F. conditions. The cylinders were molded, cured, and tested by the local Pittsburgh Testing Laboratory. Comparison bars were subjected to freezing and thawing cycles at the laboratory of the National Ready Mixed Concrete Association at Washington, D. C.

In the second group of strength tests, designated as X, Y, and Z Series, an air-entraining admix was added to all mixes to obtain from 4½ to 5 percent entrained air. Curing was conducted under standard and two special temperature conditions intended to simulate experience on construction work. These tests were conducted at the University of Wisconsin under the direction of Professor G. W. Washa. In addition to conventional compression tests, the schedule included the following tests—freezing and thawing, volume change, abrasion, heat of hydration, sodium sulphate, and sulphuric acid.

The concrete mixtures were made with the following cements and cement-blends: the cement content was equivalent to 5.3 sacks per cu. yd.; substitutions for cement were on a volume basis.

Strength Tests—The compression tests of the W Series (70 deg. F. curing) gave strengths for the fly ash blend, as compared to straight Type I cement, which were similar in pattern to other tests discussed previously in this column, namely 10 to 20 percent below the strength with straight portland cement at 7 days or earlier, slightly below straight cement at 28 days, and somewhat higher at 60 days. The natural cement blends compared closely with both Type I and Type II straight cements respectively.

In the second group of strength tests the temperature conditions named by the committee were—

Series X—Cured full time at 70 deg. F.

Series Y—Cured 3 days at 70 deg. F.; remainder at 45 deg. F.

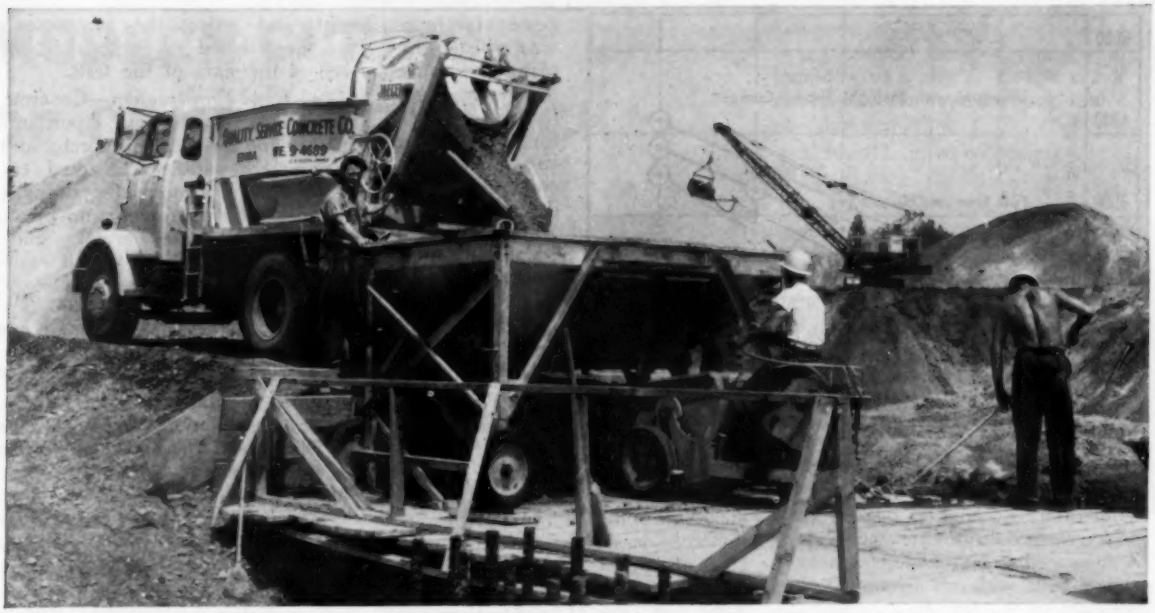
Series Z—Cured full time at 45 deg. F.

Series Y intended to simulate warm concrete placed in spring, fall,

Strength Tests of Cement Blends (p.s.i.)

	Blend by Volume				X Cured Full Time at 70 deg. F.		Y Cured 3 Days at 70 deg. F. Remainder 45 deg. F.		Z Cured Full Time at 45 deg. F.	
Mix No.	Portland Cement	Fly Ash Proportions	Fly Ash Admix	Natural Cement	7 days	28 days	7 days	28 days	7 days	28 days
AI	All Type I	...	...	...	2587	3507	2230	3023	1468	2890
AII	All Type II	...	...	...	2543	4182	2132	2943	1443	2850
BI	5/6 Type I	1/6	...	...	2278	3313	1918	2608	1431	2738
BII	5/6 Type II	1/6	...	...	2175	3723	1822	2592	1095	2315
CI	5/6 Type I	1/6	1/18	...	2300	3503	1935	2552	1421	2775
CII	5/6 Type II	1/6	1/18	...	2073	3718	1762	2398	1105	2307
DI	5/6 Type I	...	...	1/6	2348	3435	1975	2645	1674	2882
DII	5/6 Type II	...	...	1/6	2212	3883	1795	2547	1273	2468
EI	5/6 Type I	1/6	1/6	...	2363	3515	2007	2713	1350	2673
EII	5/6 Type II	1/6	1/6	...	2210	3760	1882	2665	1252	2453

TOP DOOR REMOVES to receive pre-mixed batch in one fast drop. Light, easily handled door is designed for quick opening and closing. Top charging permits use of rear discharge door which completely seals the drum.



ONE HALF-TURN OF A HAND WHEEL (grouped with other rear controls) fully opens discharge door. In transit, this door rotates with the drum, maintaining a metal-to-metal seal against loss of moisture or spilling of concrete. Job pictured here is $10,000,000 Southdale shopping center requiring 40,000 yds. of concrete.

Multiply by 43...all Jaeger

Quality, Service Concrete Co., of Edina, Minn., uses an efficient combination of central mixing plant with top loading Jaeger sealed-drum agitators. With pre-mixed concrete, top loading is, of course, the fastest method. It also permits the use of a closed discharge door which completely seals the drum while in transit. The owners, who also operate another central mixing plant in downtown Minneapolis, now have a fleet of 43 truck agitators, all Jaeger.

More ready-mixed concrete is sold in Jaeger truck mixers than by any other method. As leader, Jaeger offers the only complete line of mixers with choice of open-end or sealed-end loaders or sealed door, and water system and other equipment to fit any operation. All standard 1956 models, from 3½ to 8½ cu. yd., have 3-speed transmission, shorter center of gravity and reduced weight. Your Jaeger distributor knows your local conditions, weight limitations and practices. Check with him or send, today, for catalog.

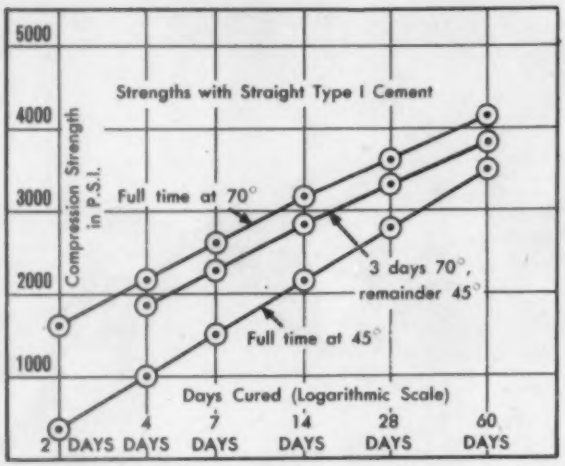
JAEGER 5′ HOPPER HEAD is ideal for discharging to buckets. Adding chute sections gives further choice of 8′, 10′ or 13′ chute lengths. Hopper can also be swung away or completely removed for direct discharge. Pour pictured is on St. Louis Park high school, near Minneapolis.

Fleet consists of 43 of these Jaeger units.

THE JAEGER MACHINE COMPANY

602 Dublin Avenue, Columbus 16, Ohio

LOADERS • COMPRESSORS • PUMPS
CONCRETE MIXERS • PAVING MACHINES



or mild winter, when the average temperature is about 45 deg. F. but no freezing could be expected. Series Z simulated "cold" concrete mixed and placed with an average temperature of 45 deg. F.

The accompanying table summarizes the strength results for the X, Y, and Z Series at 7 and 28 days; most of the strengths in the table are an average for 3 cylinders.

The accompanying chart gives graphs of the strengths with straight Type I portland cement (mix number AI) for the X, Y, and Z temperature conditions. This is an informative comparison, as the Y and Z graphs indicate the sacrifice in strength under the 45 deg. F. conditions, as compared to standard 70 deg. F. temperatures, at ages up to 60 days. The lower strengths for a given age result from the slower rate of hydration at the lower temperatures, even without any freezing.

The strength tests with the blended cement mixes showed that, percentagewise, the blends were not more adversely affected by the lower curing temperatures than the straight Type I and Type II cement mixes.

Freezing and Thawing — In the batches for the first group of tests (W Series) the air-entrainment was not closely controlled. The varying results under freezing and thawing cycles indicated clearly that a requirement for producing concrete resistant to such attack is a sufficient amount of purposeful air-entrainment. Accordingly a net air-entrainment of 4½ to 5 percent was adopted for the second group of tests (X, Y, and Z Series). After 500 cycles of freezing and thawing it was noted that the fly-ash blends compared favorably with the straight cement mixes. The natural cement blends gave a slightly poorer showing than the straight portland cements. In general there was about the same resistance to freezing and thawing attack for curing under the 45 deg. F. conditions as under the standard 70 deg. F.

Volume change and Abrasion Tests — Both of these tests produced nothing significant in judging the relative qualities of the various mixes.

Heat of Hydration —The tests indicated that fly ash has a heat evolution considerably less than the portland or natural cements. When fly ash was used to replace a part of the Type I or Type II portland cement, as in the B mixes, the heat of hydration was reduced. The BII mix (5/6 Type II and 1/6 fly ash substituted for portland cement) showed the lowest heat of hydration of the entire series of mixes. The report indicated that one of the important factors in obtaining lower heats of hydration is the use of Type II cement.

Sodium Sulphate Test — The blends of Type I portland and either fly ash or natural cement proved more resistant to attack by sodium sulphate than the straight Type I mix. The results indicated that the presence of sufficient air-entrainment also aided in resisting sodium sulphate attack. As was to be expected, the Type II portland cement mix and blends thereof with entrained air showed the best resistance.

Sulphuric Acid — The results of the sodium sulphate test were corroborated by the sulphuric acid test of neat portland cement and cement-blend pastes. Cement blends with fly ash were found to be more resistant than straight Type I portland. Type II was likewise more resistant than Type I, but fly ash blends with Type II portland cement resisted this chemical attack best of all.

Recommendations —As stated earlier in this review, the objective of the Chicago Conference Committee was to obtain comparative test data as an aid in recommending the suitable type of cement or cement blend to be used in various classes of municipal construction in the area. Following is a summary of the committee's recommendations; some of the remarks are briefed from the report, and reflect the committee's judgment based on experience, as well as the data of the tests:

(a) Road Construction—Concrete mixed with straight Type I portland cement and sufficient purposeful air-entrainment satisfies the dual requirements of compressive strength and resistance to freezing and thawing. Such concrete develops sufficient early strength to permit early opening of the pavement. (Note—The tests did not include high-early strength or Type III portland cement.) When there is no urgency to open a roadway, and early strength requirements are not a prime consideration, a blended mix of Type I and fly ash, similar to the CI mix series, may be more economical.

(b) Heavy Concrete Construction —Although there is in the Chicago area little mass construction similar to the building of dams, the tests indicated that the use of a blended mix of Type I portland and fly ash in the construction of heavy foundations, walls, and tunnel linings may be helpful in reducing cracking due to thermal changes. If it is desirable to reduce further the heat of hydration, Type II portland is recommended. Or the use of a blend of Type II with fly ash would obtain the maximum reduction of heat, unless there is resort to procedures such as lower cement content, pre-cooling of materials, slower rate of placing, or cooling of the concrete after placement.

(c) Sewers and Sewage Treatment Plants—In structures for handling sewage it was recommended that straight Type II portland cement with sufficient air-entrainment be used. If Type II cement is not available, a blended mix of Type I and fly ash was recommended as a better substitute than straight Type I mixes. Also it was pointed out that Type II cement and blends thereof resist the attack of sodium sulphate and sulphuric acid better than Type I or blends containing Type I.

(d) Air-entrained Concrete — It was recommended that, in general, all concrete should contain 3 to 5 percent of purposeful air-entrainment. The exceptions might be finished floors in buildings and certain other architectural finishes in interiors. The report recommended that air-entrainment should be mandatory in pavements and structures subject to the attack of freezing and thawing or the attack of sewage and chemicals.

(e) Curing in Winter Weather—

(*Continued on page* 261)

MODERN CURING OF CONCRETE BLOCK*

By MORRIS H. GROSS
Registered Mechanical Engineer
Detroit, Mich.

CURING concrete masonry products has become the number one problem in modern block plant production. The curing of concrete masonry products can be, and has been, accomplished at an accelerated rate by controlled application of heat and moisture. The medium from which heat and moisture has been derived is low-pressure steam. Steam is introduced into the kiln under controlled conditions of quantity, quality, and velocity.

Maintenance of an even distribution of temperature throughout the kiln is of primary importance to the proper curing of concrete masonry products. Even distribution of temperature is maintained in the kiln by the velocity of the incoming steam and the aspirating action caused by the steam entering the kiln. Steam enters the kiln at a velocity ranging from 35,000 to 55,000 f.p.m., depending upon the physical dimensions of the kiln in question and the internal load of the kiln. Since there is a limiting velocity of steam in a kiln, the physical dimensions of the kiln are of primary importance, as too long a kiln will not allow a uniform distribution of steam throughout its entire length.

When steam emerges from the nozzle, it comes out in a condition known as superheated steam. Upon entering the kiln, which is at a lower pressure than the steam in the nozzle, a sudden expansion of the saturated vapor may produce a temporary condition in which the steam continues to expand as super-heated steam without any condensation taking place. Super-heated steam of this nature is not stable and disappears through condensation of a part of the vapor. The temperature of the mass in the kiln is raised by the latent heat given off during condensation until thermal equilibrium is restored. This condensation takes place throughout the kiln because of the velocity of the steam employed, and it deposits moisture on all the masonry products present in the kiln.

In curing, during the early part of the cycle, condensation will also occur on the block because the temperature of the block is below the dew point temperature of the air in the kiln.

Actual tests conducted in the field show that moisture is deposited on the block at a varying rate until a condition of equilibrium is reached. This condition is reached when the temperature of the block is at the dew point temperature of the air in the kiln. Also if the vapor pressure of the air in the kiln is greater than the vapor pressure of the water in the block, a transfer of moisture will occur from the air to the block and *vice versa*. When this condition is reached, steam should be turned off for a period known as the soaking period.

During the soaking period the temperature drop in a well constructed kiln will be approximately 4 to 7 deg. F. per hour. During this period the absolute humidity of the air increases until the kiln temperature reaches the dew point temperature. Further drop in temperature will deposit moisture on the block. In this manner a high humidity is maintained in the kiln during the soaking period.

When the block is removed from the kiln, it is generally at a higher temperature than the surrounding atmosphere, and because of the difference in vapor pressure existing, it will throw off the water vapor, thereby decreasing the water content of the block. The amount of moisture given off is entirely dependent upon the difference in temperature and vapor pressure between the block and the surrounding air. It has also been found desirable to exhaust the moist latent air in the kiln after the soaking period for the following three specific reasons:

1. It reduces the temperature and humidity to a degree that it is not unbearable for men to work under resulting conditions.

2. It reduces the moisture content of the blocks.

3. Where mechanical means are used in loading and unloading the block, it materially reduces the toxic condition resulting from exhaust fumes of the mechanical equipment.

Kiln design is of great importance in the proper curing of concrete masonry units. Because of expansion due to the extreme variations which occur in temperatures in the kiln during the curing cycle, the roof and walls should not be tied together structurally (because of the expansion which takes place through temperature changes). The roof should be so constructed as to be free to move on the walls of the kiln and still maintain a seal tight enough not to permit any leakage. The walls should be constructed with curbs to prevent breaking of the walls proper, as a result of being hit with lift trucks in loading and unloading the kilns.

The physical dimensions of the kilns are of great importance. In a contemplated plant layout of one well known producer of concrete masonry products, the original kiln size was 13 by 57 by 7 ft. 5 in., with a capacity of 2,160 block. In analyzing this kiln size, the following facts were brought out. The plant was to be equipped with two Besser Vibrapac units. The total heat necessary to raise the kiln with its material contents 100 deg. F. was 3,303,976 B.t.u.'s. Based on a temperature rise of approximately 60 degrees per hour, this is equivalent to a steaming cycle of 1 hour and 40 minutes. In order to accomplish this it would be necessary to use a 60-hp. boiler per kiln. In the plant layout as planned it would be necessary to have a boiler capacity to steam three kilns at a time in order to get the estimated production of the machines within the 8-hour working day.

The breakdown of the heat requirements of the kiln were as follows:

Heat required to raise air in the kiln	103,536 B.t.u.	2.7%
Heat required to raise the steel in the kiln	568,480 B.t.u.	14.8%
Heat required to raise the aggregate	1,805,760 B.t.u.	47.5%
Heat required to raise the kiln surfaces	833,800 B.t.u.	21.7%
Heat required to raise the water in the block	475,200 B.t.u.	12.5%
Heat loss of kiln	35,000 B.t.u.	.9%
	3,821,776 B.t.u.	100%

*This paper was presented at the Wisconsin Concrete Products Association meeting, January 12, 1956.

The summation of this distribution results in 112.5 percent of the total heat required. In taking into consideration the yield desired and assuming that 30 percent of the hydration takes place in the steaming cycle, the heat liberated by the hydration of the cements is equivalent to 517,800 B.t.u., which reduces the amount of heat required to the above mentioned figure of 3,303,976 B.t.u.'s.

From the above figures, it can be seen that heat requirement necessary for the racks and pallets in the kiln was 14.8 percent of the total, and for the kiln surfaces 21.7 percent or a total of 36.5 percent of the requirements. This high percentage leads one to the thought that considerable work must be done to decrease the percentage of this requirement to the percentage of the total load.

In addition to this breakdown of the kiln load, the kiln should be designed so that the temperature gradient of the walls forming the kilns be such that the surface temperatures will not be conducive to the condensation of moisture on the walls and the absorption of moisture in the walls. In the curing of concrete masonry products, moisture is desired on the surface of the block and not on the walls of the kilns.

Drains should be placed in the kilns to drain off the excess water. These should be designed in such a fashion as to form a water seal for each individual kiln.

Kiln dimensions should be such that the loading time required for the kilns is the same as the steaming time required. This takes a minimum of installed horsepower for processing the block. Under these conditions the boiler is operating under a constant load and can be set to operate at maximum efficiency.

It has been found that in actual practice the smaller kiln takes proportionally less heat to bring it up to temperature, due to the fact that the kiln is open a shorter period of time, thereby decreasing the radiation loss of the kiln and raising its initial temperature.

The type of aggregate used causes the kiln load to vary over a considerable range. This is due to the fact that the specific heats of the various aggregates vary, requiring different amounts of heat to raise the material the same number of degrees.

Since heat and moisture are the two essentials required for the proper curing of masonry products, a little knowledge of the thermodynamic properties of air are of prime importance. Let us look at the accompanying table, selected from the data on thermodynamic properties of moist air contained in the American Society of Heating and Ventilating Engineers' Guide, which shows the amount of moisture necessary at high temperatures in order to maintain 100 percent humidity.

When 100 percent humidity is desired at 80 deg. F. temperature (Column A), the air must contain 0.022 lb. of water per pound of dry air (Column B). Naturally, to maintain 100 percent humidity at higher temperatures, the water requirement increases. For example, at 100 deg. F. the air contains 0.043 lb. of water per pound of dry air; at 170 deg. —0.433 lbs.; and at 200 deg.— —2.295 lb., etc.

Now if one has been in the habit of curing at 120 deg., and then decided to cure at 170 deg., the Fahrenheit temperature is increased 1.42 times (considering zero deg. as the base) but you will note from the moisture contents that the moisture in the air must be increased 5.35 times. Similarly, when curing at 200 deg., the moisture content of air must be increased 28.01 times for a 1.67 deg. temperature increase.

Another factor that must be considered is the saturation pressure of the moisture in the kiln atmosphere. This is commonly known as vapor pressure, which is the pressure exerted by the moisture in the form of vapor. Also taken from the table of thermodynamic properties of moist air, we note the following vapor pressures for saturated air (Column C) for various temperatures.

At 80 deg. the vapor pressure is 0.51 p.s.i.; at 100 deg.—0.95; at 120 deg.—1.69; at 140 deg.—2.89; at 160 deg.—4.74; at 170 deg.—5.99; at 180 deg.—7.51; and at 200 deg. —11.53. One will observe from these pressures that at 170 deg. the force is 3½ times as great as the force at 120 deg.; at 180 deg. the force is 4½ times as great; and at 200 deg. the force is approximately 7 times as great as the force at 120 deg.

The vapor pressure is exerted within the kiln at all times during the curing cycle, and it is higher than that outside the kiln. These two conditions are not in equilibrium; therefore, moisture within the kiln will be forced to the outside atmosphere. This vapor pressure is also present in the masonry unit; and because of the differential in pressures between the kiln atmosphere and the concrete, moisture will be forced out of the masonry unit by evaporation, the degree of moisture removal being dependent upon the temperature of the curing atmosphere and the length of time the masonry units are subjected to such temperatures and differentials in saturation pressures.

However, humidity measurements can be made in a kiln under these conditions from which false conclusions might be drawn. Such measurements can indicate 100 percent humidity in the kiln atmosphere, but actually moisture is being removed from the masonry units. This moisture becomes a part of the kiln atmosphere to indicate ideal curing conditions, but the binding ingredient, portland cement, is not being fully utilized because there is insufficient moisture in contact with the cement. Experience and tests have proved that a minimum water-cement ratio of 0.44 by weight of cement is required to effect the normal compounds of hydration in portland cement, which is equivalent to approximately 5 gal. of water per sack of cement.

Now consider the water present in

Thermodynamic Properties of Moist Air

(A) Temperature Deg. F.	(B) Moisture lb. per lb. Dry Air	(C) Saturation Pressure P.S.I.	(D) B.t.u. per lb. Dry Air	(E) B.t.u. of Moisture at Saturation
80	0.022	0.51	19.22	43.69
100	0.043	0.95	24.03	71.73
120	0.081	1.69	28.84	119.54 (1)
140	0.153	2.89	33.66	205.66
160	0.299	4.74	38.47	376.27
170	0.433	5.99	40.88	531.48 (2)
180	0.658	7.51	43.29	791.79 (3)
200	2.295	11.53	48.12	2677.12 (4)

Rations

	(2) to (1)	(3) to (1)	(4) to (1)
A—Temperature	1.42	1.50	1.67
B—Moisture	5.35	8.12	28.01
C—Saturation Pressure	3.55	4.44	6.82
D—Heat of Dry Air	1.42	1.50	1.67
E—Total Heat	4.45	6.62	22.40

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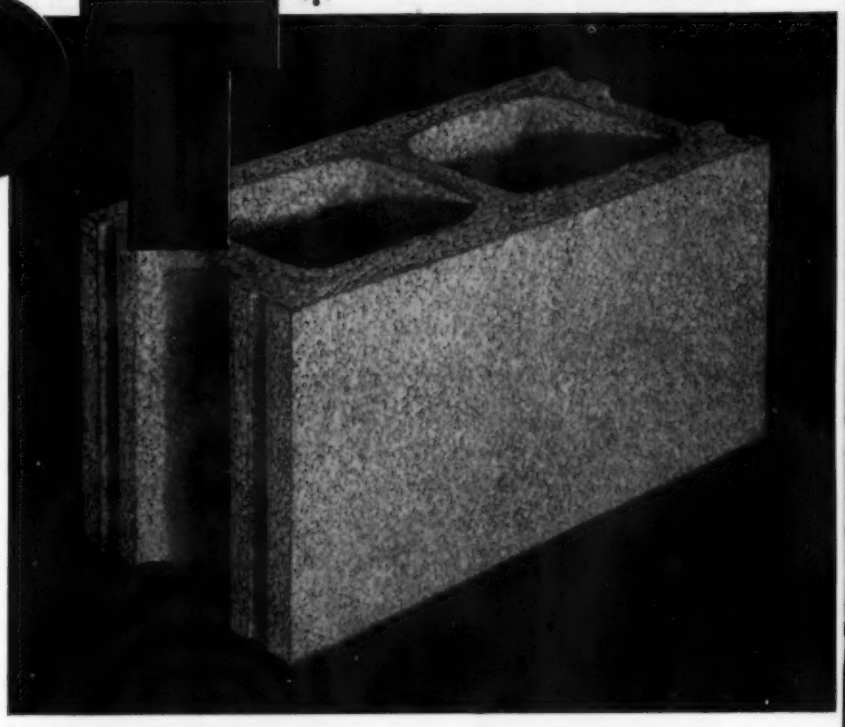

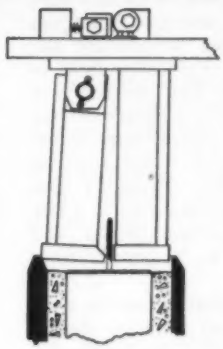

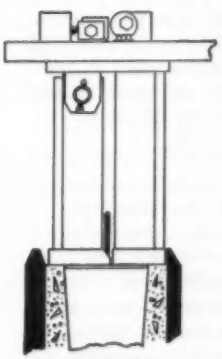

Upper drawing shows swinging stripper shoe contacting thick beveled division plate, ready to move to right — to contact stationary stripper shoe — to produce a block with U.P.T.

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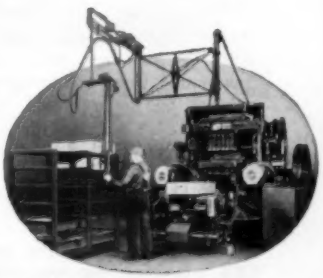

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a concrete block mix in the range of 3 to 4 gal. per sack of cement. This, in any case, is below the desired minimum water-cement ratio, and therefore it is essential that the method of curing must at least retain such water in the concrete masonry unit.

One will also note that in the accompanying table there is included the B.t.u. per lb. of dry air (Column D), the B.t.u. of moist air at saturation per lb. of dry air (Column R) for various temperatures of dry air saturated, as compared to strictly dry air. When the temperature is raised from 120 to 170 deg. F., the B.t.u. increase is only 1.42 times for dry air as against 4.45 B.t.u. increase for dry air saturated. At 180 deg. F. it is 1.50 for dry air and 6.62 for dry air saturated; and at 200 deg. F. it is 1.67, as compared to 22.40. These data were included to emphasize the ease with which dry air can be heated even at high temperatures, while considerably more energy must be expended to heat dry air saturated, particularly at high temperatures.

An important factor that should be considered in the curing of concrete masonry is carbonation of concrete. Curing in which an open fire flame is used can be very detrimental to concrete masonry products. If the fuel burned is oil, the products of combustion of oil are CO_2 and water vapor, along with the gases contained in the air necessary for combustion.

In burning 100 lb. of oil to complete combustion, one of the products is 15 lb. of carbon dioxide. If gas is the fuel, and 100 lb. of gas is burned to complete combustion, 12 lb. of carbon dioxide will be generated. Carbon dioxide will combine with the calcium oxide in the cement and form calcium carbonate, a very brittle material which will form a case hardening on the surface of the block. Although the strength may be high in tests, the block will not be a tough durable block.

Depending upon the amount of CO_2 present, the case hardening shell will vary from 1/32 to ⅛ in. thick. Blocks made under these conditions have very brittle corners and chip off very easily in yarding and shipping. The maximum allowable concentration of carbon monoxide is 100 parts per 1,000,000 and for carbon dioxide 5,000 parts per 1,000,000, as determined by the United States Bureau of Industrial Hygiene. Under some curing methods these concentrations can easily be exceeded, creating conditions which will affect the efficiency and health of the employees.

The most important item in live steam curing systems is the boiler. The size of the boiler is dependent upon the load requirements of the kiln, the number of kilns to be cured simultaneously, and the load (other than curing) which is connected to the boiler.

Boilers are rated on the basis of horsepower, one boiler horsepower being equivalent to the evaporation of 34.5 lb. of water from and at 212 deg. F. at atmospheric pressure. In other words, a 100 hp. boiler is capable of generating 3,450 lb. of steam from and at 212 deg. F. Practically all of the boiler feed water is used to develop live steam and enters at an average temperature of 50 deg. F. Under this condition the 100 hp. boiler will not deliver 3,450 lb. of steam at 212 deg. F. but only 2,960 lb., or about 86 percent of the generating capacity of the boiler at atmospheric conditions. This fact must be kept in mind when sizing the boiler for a block plant.

Because of the high percentage of make-up water needed in live steam curing, proper precautions must be taken to treat the water entering the boiler. If proper treatment is not made, scale and sludge formation within the boiler will soon cut down its capacity and efficiency and if continued will ruin the boiler. Preheating the make-up water to a temperature in the range of 175 deg. to 200 deg. F. has been found to precipitate the solids forming the temporary hardness in the water. If this preheating is done in a separate boiler, it will allow for flushing out the precipitated solids as well as deaerating the water and eliminating "cold shock" in the processing boiler.

It is important that the water coming from the boiler is in the dry and saturated state or super-heated state, because wet steam has in it water which when leaving the nozzle is traveling at a velocity in excess of 40,000 f.p.m., and this force may damage the masonry units with which it comes in contact.

In establishing a curing cycle, it was found necessary to pre-set the masonry units because a high-velocity steam entering a kiln immediately following the placing of the last rack caused a hardening of the concrete before the concrete attained its initial normal shrinkage. The result was that crazing shrinkage cracks developed.

The length of the steaming period following the properly established pre-setting period is determined by an end point which is called the equilibrium temperature. This is the temperature at which the concrete masonry and the kiln air are equal. The equilibrium temperature varies widely because the kiln charge and shape as well as the type of aggregates are factors in reaching the end point temperature. Consider the steam entering the kiln at velocities in excess of 40,000 f.p.m., causing a rapid temperature rise within the kiln. The temperature rise of the masonry unit, however, will lag behind the kiln air, and this differential in temperature effects a dew point on the masonry unit resulting in moisture added to the concrete.

This condition is highly desirable because the concrete block mix does not contain the desirable minimum quantity of water to produce the normal products of hydration in portland cement. The concrete will continue to take on moisture as long as the concrete temperature is below the dew point temperature of the air in the kiln. Humidity conditions have been measured in a kiln during the steaming period and readings as low as 30 percent have been recorded.

This proves that humidity need not be considered a factor during steaming, as long as the steam enters the kiln at a rate to produce the desired kiln air temperature from ceiling to floor in all points of the kiln and a differential in temperatures between the concrete and the kiln air sufficient to cause wetting of the concrete.

The soaking period is a phase of the curing cycle as important as the steaming period. As the kiln air temperature decreases, the humidity condition becomes a factor because the kiln, racks, pallets, and concrete are thoroughly saturated with moisture. So long as the air within the kiln is not disturbed by changing, the relative humidity of the kiln air increases as the temperature decreases because the moisture content is relatively constant. An accelerated curing condition is maintained in the kiln during the entire time that the temperature is falling to 70 deg. F.; therefore, the longer the soaking period, the more one takes advantage of a favorable curing condition; and, naturally, the better will be the ultimate product.

Considerable experimental work is being done on curing masonry units

(*Continued on page* 234)

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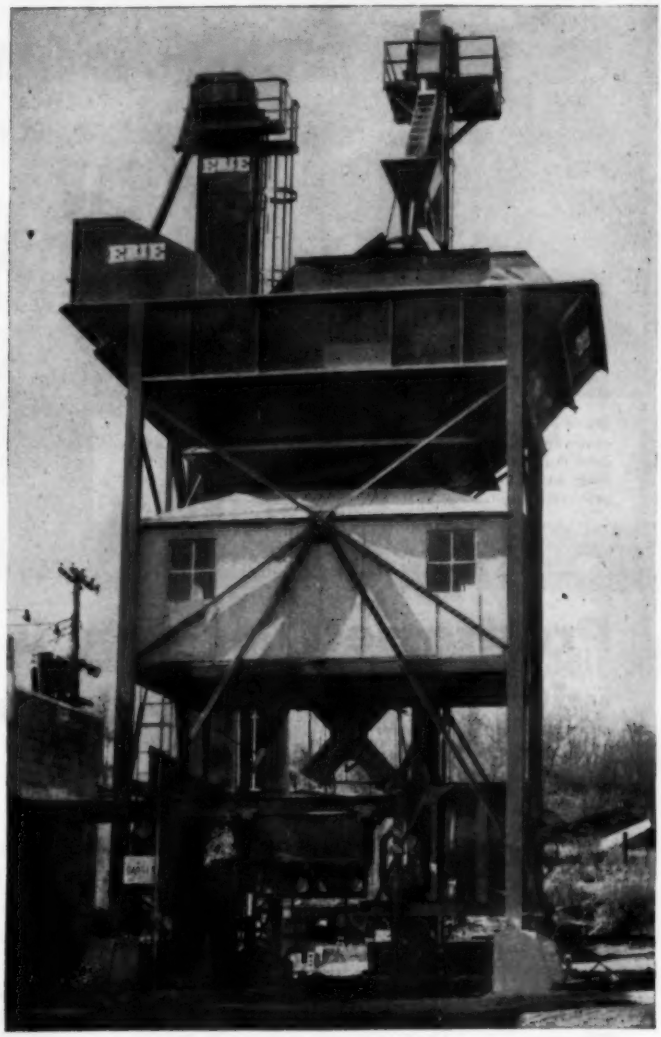

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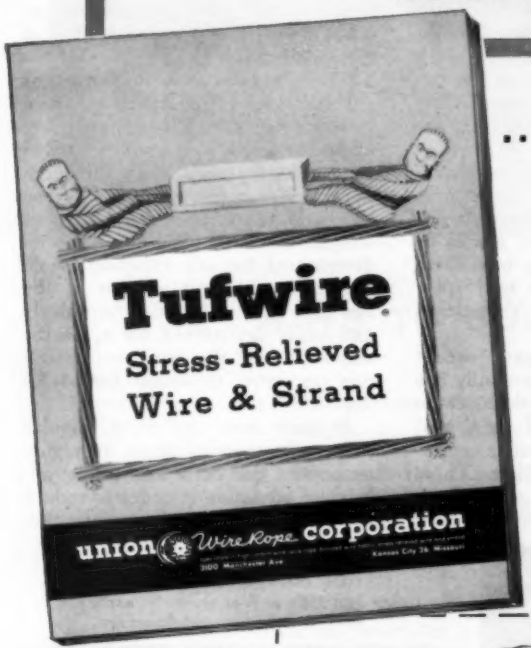

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How to Get Workability In Lightweight Concrete*

CONCRETE must have good workability if it is to function according to its design. Good workability requires that the fresh concrete be sufficiently mobile to conform to the shape of the design of the structure and yet maintain the strength of the mix design. Expanded shale lightweight concrete weighing less than 100 lb. per cubic foot is readily obtainable in the structural ranges of 3,000 to 4,500 p.s.i. with reasonable cement factors. It is easy to produce expanded-shale concrete which is uniform in consistency, batch after batch, and at the same time mobile and workable.

Properly designed expanded-shale concrete can be placed, puddled and finished with ease, thus permitting substantial savings in handling and placing costs, compared to heavyweight concrete.

To accomplish maximum results in lightweight concrete economy, the designer should understand the differences between the physical properties of expanded shale and the physical properties of sand, gravel, and crushed stone. These differences must be given due consideration in setting up and maintaining control of the mix.

Producers of expanded-shale aggregates, including expanded clay and slates, have devoted much study to the development of simple and effective methods of design and control of this type of concrete. The recommendations made by the producer of a particular brand of expanded shale aggregate, therefore, should be given full consideration. The following suggestions will assist the uninitiated mix designer in understanding the general aspects of lightweight concrete mixtures, and in understanding the reasons for specific recommendations made by the aggregate producer.

A good workable mix of expanded shale concrete should have the same general characteristics as a workable mix of heavyweight concrete. When stroked with a trowel, it should show a sufficient amount of mortar to coat and carry the coarse aggregate, but the fine mortar should not be excessive. Coarse aggregate particles should be evident in the concrete but should not stand apart or segregate from the mortar. Fine mortar should be present in just sufficient amount to hold the coarse aggregate in suspension and to provide mobility to the mixture.

A mix using sand and gravel or stone will usually comply with these requirements of from 35 to 45 percent sand and 65 to 55 percent coarse aggregate.

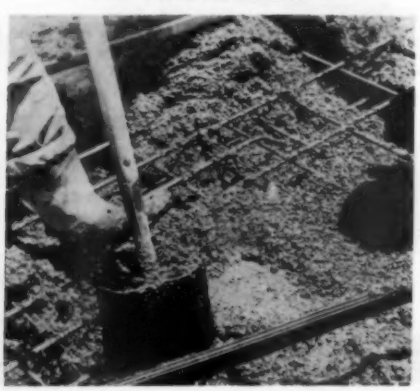
Expanded-shale aggregate (except for coated aggregates) generally has sharp, angular particle shape throughout its range of sizes, and the maximum size of coarse aggregate is usually not over ¾ in. These characteristics require a greater percentage of fine aggregate sizes in the mix in order to provide proper workability. The mix designer will find that 48 to 60 percent of lightweight fines passing the No. 4 sieve, combined with 52 to 40 percent of coarse aggregate will usually provide desired results. These proportions are by volume.

Setting up the basic mix design for expanded shale concrete by volume rather than by weight is one of the simpler methods of procedure. This is because the bulk specific gravity of expanded shale increases as the particle size decreases. The dry weight per cubic foot of the coarse aggregate, therefore, is considerably less than the dry weight per cubic foot of the fine aggregate, and the difference will vary somewhat among the different brands of expanded shale.

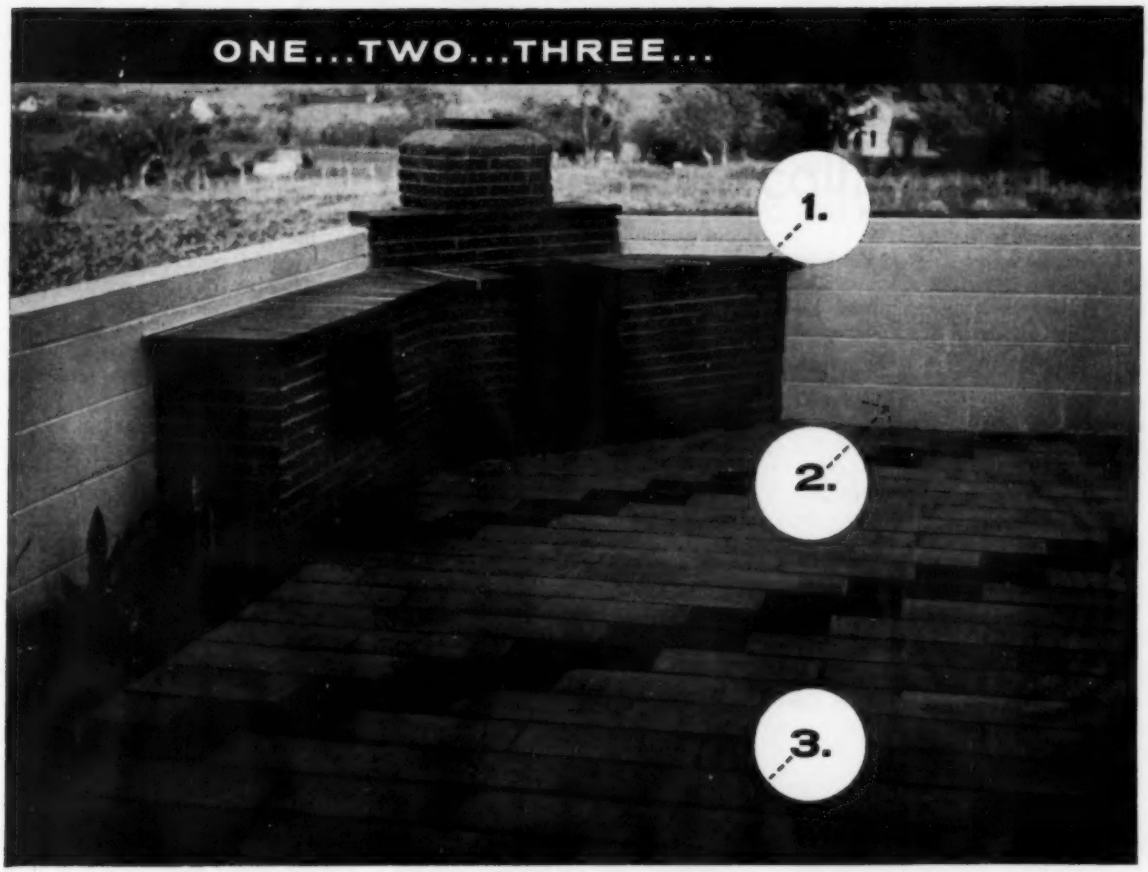
These variations in unit weight will have no effect upon the basic mix design where the proportioning of fine to coarse aggregate is worked out on a volumetric basis. This does not mean that the concrete must be batched by volume rather than weight. Once the basic mix has been determined for any expanded shale aggregate, the unit weights of the fine and coarse sizes can be quickly and easily determined for a specific shipment and the basic volumetric mix converted to weight for batching.

In most cases, the sharp, angular shape of expanded shale aggregate makes the use of a lubricating admixture advisable in order to reduce the amount of mixing water re-

*This article was issued as Information Sheet No. 1 by the Expanded Shale Clay and Slate Institute, Washington, D.C. The techniques here outlined refer only to rotary-kiln-expanded shale.



Note that this concrete, having less than a 3-in. slump, is easily worked around the reinforcement.



WAYS TO BUILD **NEW BUSINESS!**

1. The barbecue fireplace is split-stone concrete block.
2. The wall is of standard concrete block.
3. The floor is patio concrete block.

And the whole—one, two, three—adds up to an effective example of how one concrete block manufacturer is employing different types of concrete units to build new business.

It is a good example—and it is just one example out of very, very many. For wherever *new* and *unusual* uses of concrete units are found, new and more profitable sales opportunities are created for the concrete block manufacturer—proving, again, that imagination and profit go hand in hand.

A study of the construction needs in your own vicinity may uncover new opportunities for you. And for products that will give complete satisfaction, include Lehigh Cements in your plans. Remember there's a Lehigh Cement to help you produce quality units with any manufacturing process.

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LEHIGH PORTLAND CEMENT
LEHIGH EARLY STRENGTH CEMENT
LEHIGH AIR-ENTRAINING CEMENTS

LEHIGH PORTLAND CEMENT COMPANY
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quired for good workability. The most economical and readily convenient admixture for this purpose is an air-entraining agent. Entrained air in expanded-shale concrete is not required for durability but is to be considered as an additional aggregate in the form of "ball bearings", for the sole purpose of lubricating the mix.

The amount of air entrained in expanded-shale structural concrete should be fixed at the minimum required to produce desired workability in order to avoid an adverse effect on compressive strength. The designer should keep in mind that expanded-shale concrete has an established record of remarkable durability without air entrainment, and that the sole purpose of entraining air is for workability. Once the proper amount of entrained air is established by initial design, control is accomplished by merely determining the unit weight of the wet concrete for any given aggregate proportion. The amount of air-entraining agent may be adjusted slightly on occasion in order to maintain the same unit weight of wet concrete as was procured from the initial design mix.

All of the above applies to structural concrete where high compressive strength is the major requirement. Special mix designs for extremely low weights of concrete, where high strength is not of major importance, can be achieved easily by increases in the amount of air entrainment, the weight of concrete decreasing rapidly as the percentage of entrained air is increased.

Cement content, aggregate particle shape, proportions of fine to coarse aggregate, percentage of moisture in the aggregates, and the temperature of the concrete all have a bearing on the quantity of air entrained in the mix. In general practice it has been found that from ¼ to ¾ oz. of a good grade of commercial neutralized vinsol resin per bag of cement will entrain the proper amount of air.

The preceding discussion on sharp, angular particle shapes of crushed expanded shale, and the recommendations for the use of entrained air for lubrication do not apply to "coated" expanded-shale aggregates. This type of expanded shale has smoother, rounded, and coated particle shapes, not unlike sand and gravel. In establishing mix designs with this material it is generally not necessary or desirable to entrain air. Where air entrainment is indicated, a smaller amount is usually required.

Producers of coated aggregate usually furnish the material in three or four separate sizes which should be combined in the proper proportions to give a well graded aggregate from the fines to the maximum sized material. Due to the increase in bulk specific gravity as the particle size decreases, as discussed previously, the basic mix for coated aggregates also should be set up initially on a volumetric basis. A good starting point for this material would be approximately 45 percent fines, 25 percent medium, and 30 percent coarse aggregate by volume. A trial batch on this basis will immediately indicate whether minor adjustments in proportioning are advisable to meet specific job requirements.

Coated expanded-shale aggregate, under normal mixing and placing conditions, usually does not require pre-dampening prior to batching. This is not the case, however, with the angular or crushed type of expanded shale. Due to the exposed cellular surfaces of crushed expanded shale, this material has a higher degree of water absorption, and will absorb portions of the mixing water when used in the dry state.

It is advisable to pre-wet this material prior to batching in order to satisfy this absorption partially or completely and to prevent premature stiffening of the concrete mix. Brands of crushed expanded-shale aggregate differ somewhat in their absorption characteristics. Therefore it is suggested that the producer's recommendation be followed regarding the method and extent of prewetting.

Prewetting of lightweight aggregates also serves another important purpose in many concrete operations. Due to the extreme lightness of this material, serious loss of fines has resulted from breeze or wind action if the material has been unloaded and rehandled in the dry state. This has been experienced particularly where material is handled by clamshell and subjected to substantial fall from the bucket. Prewetting of aggregates will substantially limit and sometimes prevent such losses by "sticking" the fines to the coarser particles, and will minimize segregation in all rehandling operations.

Regardless of the method used for prewetting expanded shale aggregate, the aggregate should contain a uniform amount of moisture for any given period of continuous concrete mixing. There is no practical means of closely controlling uniform consistency, batch after batch, except by maintaining reasonable uniformity in the percentage of moisture contained by the aggregate going into the mixer. This rule does not reflect any peculiarity in expanded-shale aggregate inasmuch as the same uniformity of aggregate moisture content is required in the production of consistent heavyweight concrete quality. The practicability of this general plan has been proven by the successful mixing and placing of many thousands of yards of expanded-shale aggregate concrete.

In order to maintain constant yield and slump, the weight of the water contained in the prewetted aggregate should be added ot the weight of dry aggregate representing the initial dry loose volume of the mix design. This weight of water is calculated from moisture determinations. The same weight of water contained in the aggregate should be deducted from the total weight of mixing water used in the initial design, in order to arrive at the proper quantity of water to be added to the mixer.

In determining the proper consistency for lightweight concrete, it should be borne in mind that the much lighter weight of the wet concrete does not obey the law of gravity to the same extent as does heavyweight concrete. Thus lightweight concrete does not slump to the same degree as heavyweight concrete at the same consistency.

Expanded-shale aggregate concrete having equal workability and placement properties will have 2 to 3 in. less slump than heavy aggregate concrete. As a matter of fact, properly designed and mixed expanded-shale concrete having a slump of 3 to 4 in. is extremely workable and mobile, and it is rarely necessary or desirable to provide greater slump for normal placement operations.

To summarize this discussion:

1. Expanded-shale aggregate concrete should be designed by the trial batch method.

2. The initial design should be set up on the basis of loose, dry volumes.

3. Expanded-shale concrete should have a higher percentage of minus No. 4 screen aggregate than with heavyweight concrete.

4. Crushed expanded-shale aggregate concrete should contain the minimum amount of entrained air to provide workable and easily placed concrete. The amount of air entrainment should be controlled by

(*Continued on page* 261)

Cut interference, save air time, multiply radio usefulness with new General Electric Personal Channel selective calling systems

New Progress Line Personal Channel Systems provide two-way radio users with individual calling, automatic recall or "leave a call"—make possible group calling with personal communication between dispatcher and driver after the call is placed.

With G-E Personal Channel individual calling built into two-way radio systems, dispatchers can call each driver—drivers need hear only calls beamed to them. Away from vehicles, drivers may automatically be recalled to the radio by a flashing light or sounding horn. If beyond range of the recall message, a signal automatically remains lighted on the radio control unit until the call is answered.

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New Progress Line Personal Channel Systems, for individual or group calling, effectively eliminate most of the nuisance interference due to crowded channel conditions. Both systems virtually eliminate bothersome "skip" interference from distant stations.

Present users of G-E all-electronic selective calling systems report increases up to one-third in useful air time. The ability to recall, or "leave a call", saves air time previously wasted when dispatchers repeated calls for drivers away from their vehicles.

Your two-way radio dispatcher can call or signal your drivers individually, with a new G-E Personal Channel selective calling system. He pre-selects the individual driver to be called or signalled by means of push buttons. Transmissions, with or without the electronic tones which provide the individual calling or signalling function, are made by pushing either of two push bars on a desk console.

NEW DEPENDABILITY

New G-E Personal Channel Selective Calling Systems now provide the highest possible reliability of operation. A new, simplified, electronic tone receiver selects proper tones in a more exacting manner than ever before. Limits within which the receiver will accept proper tones are dependent upon BOTH amplitude and frequency. The tones accepted must have the right amplitude as well as the right frequency.

Operating ranges of present two-way radio systems are not impaired by the addition of Personal Channel Selective Calling Systems.

All Personal Channel equipment can be incorporated within a single Progress Line mobile unit case, with the same cost-saving, interchangeable plug-in chassis feature provided in all Progress Line equipment.

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Progress Is Our Most Important Product

GENERAL ELECTRIC

Modern Block Curing

(*Continued from Page* 226)

with superheated steam. The theory behind this method is that as long as sufficient moisture is present on and in the block, excessive temperatures can be used to accelerate the hydration of the cement. This principle is very similar to that employed in autoclave curing. However; it does not require the high pressure to produce the moisture and temperature but depends upon low-pressure superheated steam.

One of the favorable conditions looked for in a good masonry unit is a low moisture content in the block. Forced air circulation within the kiln is very beneficial in reducing the moisture content of block.

In drying with forced air, three phases or types of drying are encountered: (1) constant rate period, (2) uniformly falling rate, and (3) varying falling rate. In the first period, or the constant rate period, moisture is being extracted from the kiln and block at a uniform and constant rate, depending upon the temperature and the humidity, as long as free moisture is present on the block. The rate of capillary action of the block in bringing water to the surface is greater than the rate at which air removes it.

When the capillary action is equal to the evaporation rate, we enter the second phase of drying, the uniformly falling rate, the time at which the rate of evaporation is falling because the wetted surface exposed to the air circulation is decreasing at some uniform rate.

During the third, or varying falling rate period, the moisture still present beneath the surface of the block is being vaporized and is carried off as a vapor. As the thickness of the dried material increases, it becomes more difficult for the water vapor to escape.

Air velocity and distribution are the two important factors in the first two phases of drying, since surface evaporation is taking place. The velocity of air passing over the wetted surfaces determines the rate at which moisture is picked up and removed.

All drying will stop when the equilibrium moisture content is reached. At this time the vapor pressure of the circulating air is equal to the vapor pressure of the water in the material. The equilibrium moisture content varies with the humidity of the air and the properties of the material being dried.

The curing of concrete masonry is strictly a processing problem dealing with the thermodynamics of heat transfer and the chemistry of cement and is not a job of heating. The design and operation of a proper curing system are influenced by many factors, some of which are size and shape of the kiln, kiln construction, type of aggregate and cement used, yield per bag of cement, type of block machine, weight of the blocks, number of blocks per rack, racks per kiln, etc.—all of which must be taken into consideration.

(Note: Because of space limitations, a series of questions and answers, prepared by Mr. Gross and based on the foregoing paper, will be published in the next issue of the CONCRETE MANUFACTURER.*)*

Autoclaves Now Installed By Medford, Mass., Concern

At the plant of the Massachusetts Cement Block Company, Medford, Mass., autoclaves were recently installed for high-pressure-steam curing of concrete block.

Autoclaving is expected to spur the sale of block in this area, where, due to a changeable climate, concrete masonry construction has heretofore been limited. Autoclaving is said to reduce shrinkage and expansion of units 50 percent.

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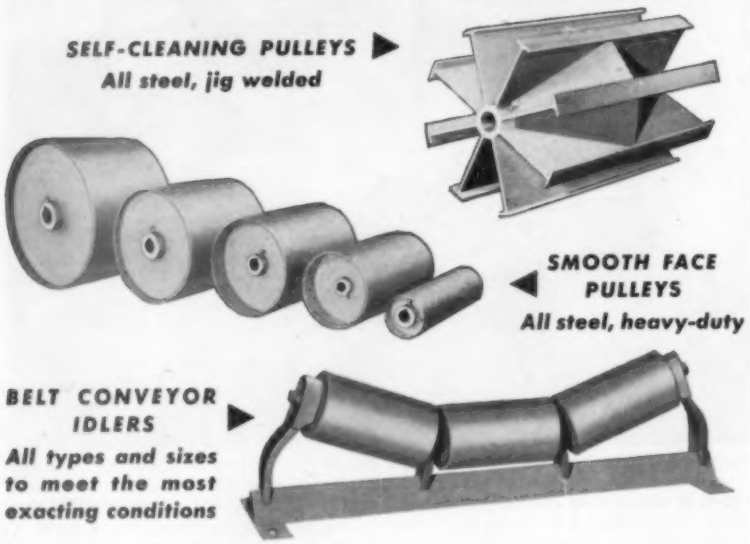

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36th Annual Convention Of N.C.M.A. Attracts Record Off-Year Crowd

Earl W. Peterson, president, National Concrete Masonry Association.

Another ON THE SPOT Report

NEARLY 1,300 men and women, representing over 400 concerns interested in the concrete block industry, attended the 36th annual convention of the National Concrete Masonry Association, held

By ROY L. PECK

at the Roosevelt Hotel, New Orleans, La., on January 23 to 25, 1956. Inasmuch as this year's meeting did not include the biennial concrete exposition, the large attendance was especially gratifying. The lure of a possible respite from the winter snows of the North might have influenced many in coming to the New Orleans meeting. Some 475 ladies were present to enjoy the varied program arranged for them during the three days.

Earl H. Peterson, president of the Ideal Cement Stone Company, Omaha, Nebr., was elected president of the association for the forthcoming year. He succeeded S. Carl Smithwick, Smithwick Concrete Products Company, Portland, Oreg. Also elected were three new directors, all for a term of five years. The director-at-large exchange arrangement with the National Concrete Products Association of Canada was continued. Walter C. Coupland, Argo Block Company, Ltd., Cooksville, Ont., Canada, will represent the Canadian association for another year.

Highlighting the series of some 25 addresses presented in the course of the meeting, the following subjects appeared to arouse the most interest: public relations and its importance in any industry; the cement shortage; new systems of block masonry; predictions of the coming building volume; the effect of private unemployment compensation; projected research and technical programs; influence of regional building codes; prestressed block systems; high-pressure steam curing; control of cracking; proper use of fly ash; and the descriptions of various drying facilities, methods, and costs.

In addition to the strictly technical or operational topics named, there were presented several other addresses of inspirational character which were commendable for their "uplift" effect. The general theme of the meeting exhibited optimism for the coming year; but in many private discussions there were some undertones of doubt as to possible effects of the coming national election on the industry. The apparent increase in competitive activity over the last few years has erased most of the complacency on the part of many producers of blocks who felt that their business volume would ride along on the crest of construction without too much effort on their part.

Many of those attending the meeting took advantage of the preceding weekend to enjoy the sights and recreational facilities of the city. On Sunday afternoon about 100 early arrivals accepted the invitation of the Board of Commissioners to enjoy a two-hour trip up and down the Mississippi River on the city's speedy yacht, *Good Neighbor*. The industrial and manufacturing facilities along the river seen and described on this trip, left little doubt in the visitors' minds that New Orleans deserves its position as the second port of the nation in dollar value of foreign trade. That evening most of the visitors sampled the culinary delights of the famous New Orleans French Quarter.

Annual Reports

S. Carl Smithwick, president of the association for 1955, presided at

Left: Rev. A. M. Serex (left), who pronounced the convocation at the meeting, and Carroll Strohm Jr., secretary-treasurer, N.C.M.A.

Right: New directors: (Left to right) W. B. Hovey, Santa Fe, N.M.; Franklin K. Williamson, Winter Park, Fla.; and Max H. Miller, Wichita, Kans.

S. Carl Smithwick, retiring president (left), wishes his successor, Earl Peterson, good luck.

the opening business session on Monday morning. After an invocation delivered by the Rev. A. M. Serex of New Orleans, a welcome address was given by Victor H. Schiro, acting mayor of New Orleans. After telling his audience of the triple growth of business in his city over the last 15 years and of other impressive statistics relating to its progress, Mr. Schiro concluded an inspiring address by presenting certificates of welcome to Messrs. Smithwick, Peterson, and George Katterjohn, president of the Southeast group of the N.C.M.A.

The treasurer's report was presented to the meeting by Carroll Strohm Jr., secretary-treasurer of the association. After the recital of the usual figures bearing on the financial standing of the association, Mr. Strohm showed three slides which described in a very interesting manner the breakdown of the distribution of all funds received by N.C.M.A. It was announced that this complete and detailed report would be mailed to all members.

A. R. Waters, Carter-Waters Corporation, Kansas City, Mo., chairman of the budget and finance committee of the association, added pertinent remarks on the report of the treasurer. He emphasized that his committee always endeavors to operate on the democratic principles best for the whole membership. He described the formation of the annual budget as a grouping of the various estimated departmental expenses made at the start of each year, at which time it is decided which activities will be carried out. This is then submitted to the board of directors (who usually reduce it, he said), and finally it is turned over to Elmer W. Dienhart, executive secretary, for administration. This year's budget of some $254,000 provides for a 20 percent increase in membership dues, to provide $35,000 more for research activities contemplated in 1956. It also authorizes the technical problems committee to solicit $25,000 from members to aid in this research program.

Mr. Smithwick introduced A. G. Streblow, chairman of the nominating committee (consisting of the three immediate past-presidents). The slate of new directors read by Mr. Streblow was unanimously approved. The new directors and their business affiliations are as follows: W. B. Hovey, Hovey Concrete Products, Inc., Santa Fe, N.M.; Max H. Miller, United Cement Products Co., Wichita, Kans.; and Franklin L. Williamson, Holloway Concrete Products Company, Inc., Winter Park, Fla. Mr. Streblow pointed out that the choosing of new directors is an exacting annual chore of selecting members who represent both the smaller as well as the larger producers geographically, who are qualified professionally, who are able and willing to give much of their time to association work and who can pay their own way in the discharge of their duties as directors. He listed the qualifications of each of the new directors chosen.

President's Annual Message

In an inspiring and all-encompassing address on the activities of N.C.M.A. during his year in office, S. Carl Smithwick, retiring president, declared that leadership brings with it a great responsibility, an obligation to keep working toward the goal of ever better production and greater efficiency, but that it had also been to him a most heartening and enlightening experience. He explained the makeup of the association, the functioning of the board of directors and of the committees, for the benefit of the newer members and those in the audience who were not yet members. He commended particularly the committees on technical problems, promotion, membership, and those who handed the local, state, and regional association relationships, trade relations, budget and finance, and accident prevention..

He briefly discussed the profoundly important matter of the long-range engineering and technical research program, which he called an eloquent tribute to the wisdom, vision, and foresightedness of the members. He complimented those who had made possible the participation in the tests of concrete block houses to withstand the atomic blast at Yucca Flats, Nev. Certificates of appreciation were presented to these men in this connection: A. G. Streblow, Basalt Rock Co., Napa, Calif.; Elmer A. Peterson, Rocklite Products, Ventura, Calif.; Cedric Willson, Texas

Victor H. Schiro, acting mayor of New Orleans (left center) presents certificates of "keys to the city" to George W. Katterjohn (left), S. Carl Smithwick, retiring president, and Earl W. Peterson, incoming president of the N.C.M.A.

Executive staff of the N.C.M.A. (left to right): Theodore Lebo Jr., manager, Washington, D.C., office; W. P. Markert, director of promotion; R. E. Copeland, director of engineering; and E. F. Dienhart, executive secretary.

Industries, Inc., Dallas, Tex.; and B. F. Park, Buildex, Inc., Ottawa, Kans. Mr. Smithwick also complimented Fred Reinhold, Buffalo, N.Y., for his generosity in naming the association the beneficiary of a $15,000 insurance policy, and urged that other members consider this type of aid to N.C.M.A.

Engineering Report

R. E. Copeland, director of engineering of the association presented his annual report covering this phase of association work. He showed slides describing the various technical bulletins, building code interpretations, and reports of the technical problems committee which had been issued to members during the year. He stated that N.C.M.A. had been active throughout the year in several technical organizations, including the American Society for Testing Materials, the American Concrete Institute, the American Standards Association, the Pacific Coast Building Officials Conference, the Building Officials Conference of America, and others.

Promotion Report

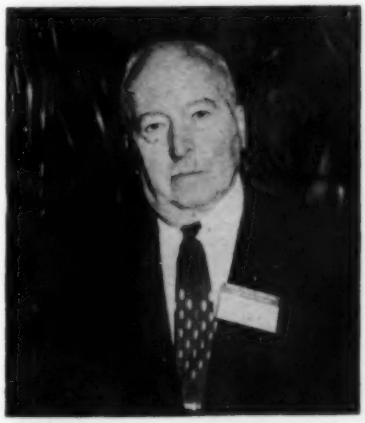
W. P. Markert, director of promotion, gave a highly educational presentation of the promotional activity carried on by N.C.M.A. in 1955, showing slides descriptive of the many brochures which had been furnished to members to help them in the sales of their products. He stated that the *Concrete Masonry Pictorial* now enjoys 20,000 circulation, up 15 percent in the last year. *Facts About Concrete Masonry* now being revised, he reported will shortly appear in a new form.

Mr. Markert described a proposed new system of distributing photographs which will be followed in the future. He also showed samples of a new concrete masonry unit which can be produced with architectural surface indentations which will result in attractive wall effects.

Washington Activities

Theodore Leba Jr., manager of the association's Washington, D.C., office, reported on promotional work done there in 1955. He stated that he had completed a series of nine seminars on the application of crack control in military structures of concrete masonry. These were delivered at the various Division Engineer offices of the Corps of Engineers, before audiences of architects, engineers, specifications writers, and others representing firms under contract to the U.S. Corps of Engineers.

Phillip Paolella, Plasticrete Corporation, Hampden, Conn., who described a new concrete block system.



Thomas W. Holden, vice-chairman, F. W. Dodge Corporation, New York, N.Y., who told of the construction boom.

William R. Conners, vice-president, Bricklayers, Masons and Plasterers International Union, Washington, D.C.

Mr. Leba described other phases of his work with government agencies which should aid materially in the use of blocks throughout the country, especially in F.H.A. and V.A. projects in any locality. After his talk the members of the trade relations committee of N.C.M.A., which includes Mr. Leba, were introduced. Others on this committee, which has done a splendid job in establishing cordial relations with labor organizations in the industry, included Fred Reinhold, Buffalo, N.Y., W. R. Conners, Washington, D.C., and Albert J. Faber, Paramus, N.J.

Mr. Leba again outlined the reasons for having a Washington office of the N.C.M.A.—(1) to promote the use of concrete masonry products among government agencies and private design offices; (2) to keep abreast of those policies promulgated by various government officers which affect the industry; (3) to assist individual producers in problems which can be handled only at the national level. He cited a recent case, of his objection to the proposed designation of brick to be considered to include only clay brick, before the Federal Trade Commission hearings on the subject. No ruling has yet been made on this, but Mr. Leba feels that it is of sufficient national interest to the industry to give the controversy the widest publicity, to prevent this apparent discrimination from being authorized.

Public Relations

A high point in the morning's program was the address by Edgar Forio, vice-president, Coca Cola Company, Atlanta, Ga., who delivered an address on *Public Relations and Sales*. His talk was of unusual interest to his audience. Speaking extemporaneously, Mr. Foric proved an adept artist in interpreting his ideas on his subject and how important it is to any business man. He stated that his association with his company covers the 36-year life of N.C.M.A., and drew a parallel between the apparent dissimilarity of the two products and the need of the best public relations by both organizations. We need friends as much as we need customers, he declared, adding that friends are in many instances the more important.

Human nature, he pointed out, plays a greater role in business than many other factors usually accredited, and we should know more about that factor if the business is not to go into oblivion in the next generation. The purpose of public relations is to build good will, the factor which makes tomorrow's business more than an accident; and unless we properly assess the public reaction to our endeavors, no amount of advertising or other promotion

will put the product over. It was announced that a transcript of Mr. Forio's talk would be made available for general distribution.

Cement Shortage

Monday afternoon's session opened with a talk by William M. Avery, editor of *Concrete* magazine, entitled *The Cement Shortage in the Block Industry—Fact or Fancy.* It included factual information on the cement supply in the future and drew some conclusions as to whether the block producers who had alleged the shortage had hurt their business in past years would again be hurt in the future. It was Mr. Avery's contention that if the industry could succeed in supplying the concrete masonry required for 20 percent of the extraordinarily large residence building program—as some producers claim is being done—the result would be chaos, as this amount of cement is not available, now, nor in the immediate future. He stated that influences other than a cement shortage accounted for most of the lost business in the last few years and that the fruition of plans for increased cement capacity in the next two or three years should allay the fears of those who use this basic commodity.

New Units

Philip Paolella, Plasticrete Corporation, Hampden, Conn., described his company's approach to meeting the competition of poured basements, in the new "groutwall" construction, a form of wall construction in which the usual masonry joints are absent. In this system (its conception generally accredited to Frank Lloyd Wright), the blocks are laid up and a strong cement grout is poured into a tier of holes through each course, in place of the usual mortar. The unit is a three-core, hollow unit with a solid top and an open channel on the bottom, made of either lightweight or heavy aggregates. The top and bottom faces are ground on a dual-wheel horizontal grinding machine. The flow of the grout in each course as laid results in a very strong wall which is competitive with that of poured concrete.

Mr. Paolella showed slides illustrating the construction of the wall and subsequent tests under hydrostatic pressures. He said that the cost of such a wall in his area is about 45 to 55 cents per sq. ft., without parging or waterproofing, and that this will save the builder about 5 cents per sq. ft., or $50 per average basement. He demonstrated the structural strength of this wall in dramatic fashion that was quite convincing to his audience.

Trade Relations Committee of N.C.M.A. (left to right): Fred W. Reinhold, Buffalo, N.Y.; W. R. Conners, Washington, D.C.; Albert J. Faber, Paramus, N.J.; and Theodore Leba Jr., Washington, D.C.

Members who participated in atom bomb test program (left to right): A. G. Streblow, Basalt Rock Company, Inc., Napa, Calif.; Elmer A. Peterson, Rocklite Products, Ventura, Calif.; Cedric Willson, Texas Industries, Inc., Dallas, Tex.; and B. F. Park, Buildex, Inc., Ottawa, Kan.

G. A. W. Negotiations

Lee C. Shaw, of Seyfarth, Shaw and Fairweather, Chicago, Ill., made an analysis of private unemployment compensation and its suggested effect on industry, in discussing the significance of the guaranteed annual wage negotiations carried out in 1955. In detail, Mr. Shaw traced the progress in bargaining rights attained by the labor unions since the start of CIO in 1937 up to 1955, the most realistic year of union advances. One union, he said, now represents 16,000,000 out of a total of 17,000,000 union workers. The concepts which take care of the employee from the date of his employment to his death, he claimed are socialistic in character. He drew the direct comparison with the gradual buildup of the power of the socialist reforms in Great Britain by the Labor Party, which at its height almost bankrupted the country. At that time every person not working received a high percentage of his regular pay from the government.

Mr. Shaw feels that the pattern which the CIO-UAW evolved with certain large corporations of this country will spread rapidly into every industry unless cognizance is taken of its evil possibilities. He feels

that the guaranteed annual wage or any of its forms, would immobilize labor and seriously affect our national economy unless well-informed men take steps to curb the present power of union leaders.

Construction Activity

Thomas W. Holden, vice-chairman, F. W. Dodge Corporation, New York, presented the final address of the afternoon, *As The Nation Grows, It Builds.* Construction activity in 1955, he said, established all-time records in building. The year represented the 11th straight year of gains, the volume being 20 percent above that of the preceding year.

He presented five basic reasons for this growth: (1) annual population increases rose from a rate of 900,000 in 1930 to the 2,700,000 in 1954; (2) production capacity doubled since 1930, the 167,000,000 people requiring 60 percent more now than they did in 1930; (3) actual production increased 2½ times in the same period and farm output increased 30 percent; (4) a matured money and credit system, in which vast increases in savings and continuance of housing credit were responsible market factors; (5) numerous stabilizers were built into our economy, which maintain private spending when government expenditures fall off. He cited television, automobiles, increase in the fields of service, etc., as examples of these influences. Another factor basically responsible for the increased growth of the country is the fact that over 4,000,000 babies are born each year.

These factors, Mr. Holden declared, are continuing, and construction is keeping pace with the 11 percent yearly growth of the country. People are now raising their sights for the future, looking forward to $575,000,000,000 production in 1965. In working toward this goal, all construction needs will increase proportionately. Blighted areas must go, he said, to be replaced with a residence volume of 1,300,000 new homes each year. The total new construction volume will equal approximately 10 percent of the national gross product, and alterations will add another $15,000,000,000 yearly. Mr. Holden expressed doubt that this pace could be maintained without the wholehearted co-operation of the building materials manufacturers, by the use of increased production methods, and by better utilization of manpower. In this effort he said, there is no place for malingerers.

Forecast, 1975

The Tuesday morning session opened with the showing of a film produced by the U.S. Chamber of Commerce entitled *People, Products and Progress: 1975.* This film depicted what life in America *can* be like in that year. The forecasts which were made in this picture are based on sound, carefully calculated studies by leading trade associations and various business concerns. They paint quite a rosy picture for the practical planners and also the dreamers in any line of business endeavor.

Competitive Activity

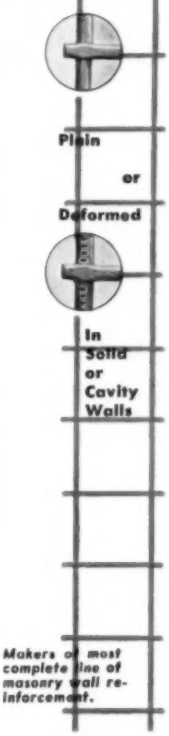
William R. Conners, first vice-president, Bricklayers, Masons and Plasterers Internationl Union, Washington, D.C., in a paper entitled *Concrete Masonry's Part in the National Building Program,* told what his union is doing to promote more masonry construction, and asked what is being done to fit concrete masonry into this picture. He cited these threats to the continuance of

(*Continued on page* 243)

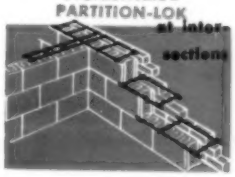
Build Better Walls with Quality Guaranteed

BLOK-LOK

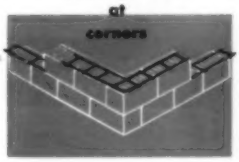
FLUSH-WELDED JOINTS—STRONGEST BY COMPARISON



Prefabricated PARTITION-LOK at intersections

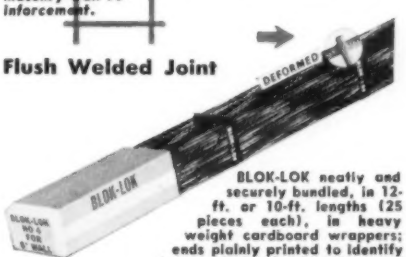


Prefabricated CORNER-LOK at corners



Prefabricated CAVITY-LOK

Flush Welded Joint



BLOK-LOK neatly and securely bundled, in 12-ft. or 10-ft. lengths (25 pieces each), in heavy weight cardboard wrappers; ends plainly printed to identify type and size for inventory and order-filling convenience.

Finishes

Galvanized wire, hot-dipped galvanized and brite basic.

BLOK-LOK Standard 9 gauge steel wire

BLOK-LOK Special Standard 8 ga. deformed side rods, 10 gauge galvanized cross rods, 16" centers

BLOK-LOK Heavy 3/16" rod with 9 ga. cross member

FS-Standard 8 ga. deformed side rods by 12 ga. cross rods flush welded on 16" centers, all galvanized wire.

YOUR ASSURANCE OF

- Small Masonry Joints
- Minimum Job Breakage
- Maximum Structural Strength
- No Obstruction to Mechanical Trades

Extensive testing laboratory reports serve to confirm the sound engineering of Blok-Lok's design. Exceeds requirements of A.S.T.M. specifications A-82-34 and A-15-52T.

Distributors and dealers located in all major cities of U.S. and Canada.

FREE—Concrete Block Wall Calculator identifies number of blocks required. WRITE FOR YOURS TODAY

A A WIRE PRODUCTS COMPANY

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They're swapping minutes for dollars!

Worthington MIXERAMA proves on your job that a Hi-Up Mixer earns more for you!

You're looking at the unique new truck mixer demonstration that's got the Ready-Mix industry buzzing!

Hundreds of Ready-Mix men are finding out at MIXERAMA that no other truck mixer is in the same league with the Worthington Hi-Up. MIXERAMA is an eye-opening exhibition of Hi-Up performance — *and you see it at work right on your own job!*

Sure, we're proud of the Hi-Up Mixer. So proud, in fact, that we make a special point at MIXERAMA of letting you do just about anything to the Hi-Up that strikes your fancy. Try out the clutch . . . swing out (or on!) the sturdy discharge chute . . . climb *inside* the drum (of the Cutaway Mixer)— we want you to see for yourself just why we say the Hi-Up Mixer is your best buy . . . why no other mixer is in the same league when it comes to delivering *more uniformly mixed* concrete *faster!*

Tell your Worthington distributor you want to see MIXERAMA, with a Hi-Up loading at your plant and then delivering concrete to your current job. Or watch MIXERAMA in your area—your distributor will set up the date. It's the most convincing demonstration you've ever seen. And it's staged under operating conditions that *you* select . . . the tougher, the better! Call your Worthington distributor today and tell him you want to see MIXERAMA right away.

The Whittemore Co. watched MIXERAMA ... then bought Five Worthington Hi-Ups!

Whittemore Co. V.P. says, "I've never seen a more sensational demonstration — nor a better truck mixer than Hi-Up"

Mr. A. Lovetere knows truck mixers inside out, knows from years of experience what kind of performance they *must* deliver to pay off for him.

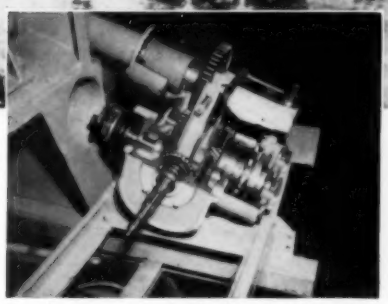
Just recently he attended a Worthington MIXERAMA. As he says, "There's no better way to find out what a Worthington Hi-Up Truck Mixer can really do. And what I saw sold me completely on Worthington.

I also learned that one of the basic reasons for Hi-Up performance is Worthington's big research program on concrete mixing. They've built their research findings right into the Hi-Up design—and you can see the results in the quality of concrete it delivers.

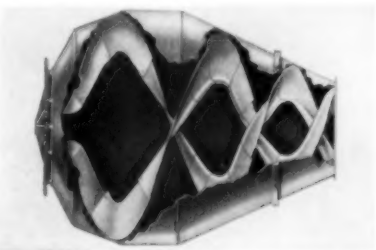
Every man in this business ought to see a MIXERAMA demonstration—it certainly opened *my* eyes. For me, there's no better truck mixer than the Hi-Up."

Be next in line!

See the Hi-Up in MIXERAMA or see it at your Worthington distributor. Worthington Corporation, Concrete Machinery Division, Section R.6.1A, Plainfield, New Jersey.



Toughest transmission built today. No adaptation of commercial unit, it's *designed* for mixer use. Single-lever operation for easy control from either end.



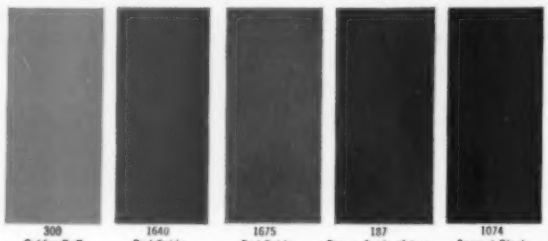
Beating this drum is impossible! Drum and blades are made of abrasion-resistant steel. Blade design gives thorough mixing, fast discharge. Advanced water system for precision mixing.

MIXERAMA'S on the way to you!

WORTHINGTON

If It's a Construction Job, It's a Hi-Up *Job*

V-Belts • QD Sheaves • Air Compressors • Air Tools • De-Watering Pumps • Truck Mixers



A guide for choosing concrete colors

For producers of split blocks, patio blocks, concrete blocks and other colored concrete products.

Manufacturers of colored concrete products agree . . . *The pigments they use must have these 3 important qualities:*

1. A high degree of tinting strength when added to the mix
2. Color uniformity year in, year out
3. The ability to incorporate easily

Manufacturers also require a pigments supplier whose technical department is capable and cooperative, whose shipping service is prompt and dependable.

Point for point, REICHARD-COULSTON quality-controlled pigments and dependable service meet *all* these requirements!

The shades shown above are just 5 of the many concrete colors manufactured by REICHARD-COULSTON. Included are yellows, buffs, maroons, grays, reds.

For a free color card, fill in and mail the coupon. Act now.

GENERAL RECOMMENDATIONS: PASTELS (*Split blocks and similar products*), 2-4 lbs. for each bag of cement. DEEP SHADES (*Patio blocks, concrete blocks, etc.*), 6-8 lbs. for each bag of cement.

Reichard-Coulston, Inc.

15 EAST 26th STREET, NEW YORK 10, N. Y.

Warehouses in principal cities; factory: Bethlehem, Pa.
Over a century of manufacturing and service

Natural RC IRON OXIDE PIGMENTS *Synthetic*

REICHARD-COULSTON, Inc. CM-36
15 East 26th St., N. Y. C. 10

Gentlemen: Please send me a free card of REICHARD-COULSTON concrete colors.

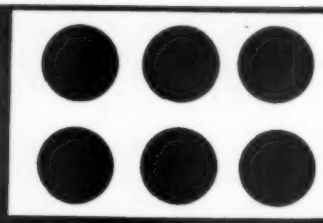
My name_____ Title_____

Company_____

Address_____

City_____ Zone____ State_____

ST. LAWRENCE CEMENT — CIMENTS DU ST-LAURENT



Soon to serve Ontario

To answer to the demand for Portland Cement in the Toronto area, the St. Lawrence Cement Company is presently building a modern cement plant in Clarkson, near Toronto.
Starting production on January first, 1957, the new plant will produce a staggering 12,000,000 bags of cement yearly. A total of 18,000,000 bags a year with the Quebec plant's production.

ST. LAWRENCE CEMENT CO.

18,000,000 bags of PORTLAND CEMENT ANNUALLY

STAR BUILDING, 80 KING ST. WEST, TORONTO, TEL.: EMpire 2-2541
HEAD OFFICE: VILLENEUVE, QUEBEC, TEL.: MONTCALM 3-7831

N.C.M.A. Convention

(*From page* 239)

the expanding use of concrete block: the lessening use of masonry in the exterior face of all types of walls, occasional poor grades of material, nonuniformity of units, poor workmanship, substitute materials, and supply shortages.

In a recent national survey made to determine the costs of all materials used in enclosing walls, it was shown that masonry materials cost from $1.40 to $4 per sq. ft. and averaged $2 per sq. ft. Metal exteriors cost from $3.20 to $15 per sq. ft. This disproportionate cost, Mr. Conners claimed, would be even more if installation costs of "metal skin" types of wall included the costs of attaching these panels to the frame of the building. He cited instances of failures in metal skin exteriors which reveal that this type of wall has many shortcomings to which the building public is not alert. He stated that his union is endeavoring to reveal these faults of competitive materials and installations by publicizing all such instances noted.

Technical Research

As chairman of the technical problems committee, T. L. Goudvis, Elyria, Ohio, presented a summary of the activities of this N.C.M.A. group and the significance of its work. At the outset of the studies made by this committee the industry was confronted with many problems. Decisions had to be made as to which of these were the most important to tackle and what were the characteristics of a good concrete block. These matters in turn raised other questions as to how to obtain lower costs, better grading of aggregates, lower cement content, lower labor and operating costs, and an adequate supply, to the end that the user would be satisfied.

Mr. Goudvis suggested that whenever possible, member plants be used for conducting research, in order to lessen the costs of such work. He believes that such technical research can be done better in this way than in outside facilities, and that more practical results will be obtained. He cited relative data regarding the growth of industrial research as conducted in 1929, of $160,000,000, against the amount of $3,750,000,000, or nine times as much spent for such work in 1954. He drew a comparison between the current N.C.M.A. expenditure for technical research—only 1/40 of the average research expenditure of all manufacturing industries.

T. L. Goudvis, Elyria, Ohio, chairman, technical problems committee, discussed the long-range technical research program.

Following Mr. Goudvis' paper, W. R. Ireland furnished a brief summary of membership plans by the N.C.M.A. Since 1950 to the present time the association has added 52 new regular, 21 associate, and 56 contributing members. In this period a net gain of some 66 members occurred, representing a growth of about 10 percent. The present total of all classes is 711 members, whose plants produce 75 to 80 percent of the total concrete block output.

Clayton Rand, author, editor, speaker and columnist, Gulfport, Miss., presented a thought-inspiring address, spoken in the language of those eager to stimulate the American way of thought. Drawing from his vast store of experience in meeting people in his many years of travel, Mr. Rand proved that he was an "eternal optimist," capable of creating enjoyable diversion at a meeting otherwise engaged in too-serious discussion of business.

Building Codes

M. L. Clement, director, Southern Building Code Congress, Birmingham, Ala., opened the Tuesday afternoon session with an interesting paper on building codes and their influence on the technical requirements of concrete masonry. During the last 25 years, "model" regional building codes have attained widespread use throughout the country. The impact of these codes on practice and construction requirements was discussed by Mr. Clement, with special emphasis on the Southern Standard Building Congress Code, adopted by some 327 Southern cities which are members. He said that this code had effectively reversed conditions which had impeded the use of concrete masonry during the last 20 years. In most cities the code was put into operation about 1946, and it has since created markets for concrete block which had been barred in some prior codes.

Mr. Clement feels that N.C.M.A. through regional efforts was largely responsible for getting concrete units into various other codes. He named several codes now in effect which present satisfactory standards in different regions, and urged that revisions to any code follow the general form of these approved codes. He congratulated the membership of N.C.M.A. on approving the long-range technical research program, which he said is good market insurance, presenting expansion possibilities for the future.

Prestressed Unit Floors

Carroll Strohm Jr., Nashville Breeko Block and Tile Company, Nashville, Tenn., and secretary of N.C.M.A., gave a very interesting description of his company's prefabricated concrete masonry and precast floor and roof systems, which have developed a profitable market for this type of unit. The potential market for new and more efficient floors and roofs is tremendous, Mr. Strohm asserted. He showed a series of slides descriptive of the details of the system, and related how the company has progressed through a process of trial and error in attaining present production.

The first job the firm completed was that of the Nashville Stadium, where the prestressed beams were first fabricated at the job site and later on at the plant. In order to obtain the best control of concrete, the company built a separate plant, in which beams were first made utilizing post-tensioned 5/8-in. cables. Later, better fittings and smaller, higher-tensioned cable were adopted. The minimum strength of the concrete units—4,000 p.s.i. in 24 hours—was obtained by means of high-early-strength cement.

Mr. Strohm stated that the poured channel slab has proved most successful for his company, and that these are now made in lengths up to 65-ft. roof spans. Expanded clay or shale aggregate is used in the block units. This has resulted in a greatly expanded block business. In their first trials, promotion was carried on with persons other than architects, but architects now specify prestressed units in many projects. The company produced over 5,000,000 sq. ft. of this type of roof and floor slabs in 1955.

Autoclaving Costs

One of the highlights of the meeting was the paper presented by

Cedric Willson, Texas Industries, Inc., Dallas, Tex. His subject, *Economic Considerations in the Selection of High Pressure Steam Curing Systems*, cost in producing autoclaved blocks, is of current interest to many producers, and Mr. Willson's presentation included practically every detail of costs experienced by his company in the changeover to such curing in recent years. Because of the great interest displayed by the industry in this subject, N.C.M.A. plans to publish this paper for distribution to members in the near future. The paper was coauthored by Rudolph C. Valore Jr., who is manager of research and development of the company.

Cracking Control

R. E. Copeland, director of engineering, N.C.M.A., presented in an extemporaneous talk *A Rational Approach to the Control of Cracking*. This previewed the information and recommendations being developed for a manual on crack control which will be published by the association in the future. He referred to a paper on the subject which he had furnished members two years ago, in which the various complex considerations affecting shrinkage cracking had been explained. These covered wall reinforcing, bond beams, joint reinforcing, weak or strong mortar, aggregates, and the many other factors which must be taken into consideration.

Ideas as to how to stop cracking in masonry walls are gradually crystallizing, he said; but it will require considerable research to derive the answers to all the questions which are still unanswered. Since the architect and engineer should know the fundamentals of masonry wall cracking and the causes thereof, the new manual will specifically detail all phases of the problems of proper design and installation. Only those theories which present a rational approach to the whole problem will be presented. Mr. Copeland showed a series of slides illustrating the types of studies which will be made on stresses produced by restrained shrinkage, extensibility, etc.

President-elect's Greeting

Wednesday's session opened with an address of welcome by Earl W. Peterson, Ideal Cement Stone Company, Omaha, Nebr., president-elect of the association for the forthcoming year. Mr. Peterson was introduced to the members by S. Carl Smithwick, retiring president, who thanked the members for the help afforded him throughout his term of office.

Mr. Peterson said he was well aware of the responsibilities of his office and the honor conferred upon him. The theme of his talk dealt with the problems which the industry faces today. He cited price cutting among producers in many areas, which is becoming a serious menace to normal operations. If a producer cuts his price 10 percent, he must increase his volume of sales by 66 percent to get the same return on profits. If the price cut is 20 percent, the volume of sales must be increased by 400 percent for the same net return. Mr. Peterson's entire address will be furnished all members in the near future.

Safety Awards

Henry Quaritius, Nailable Cinder Block Corporation, New York, N. Y., and chairman of the accident prevention committee of N.C.M.A., made the presentation of the trophies awarded in the second annual safety contest which the association sponsored for the 12-month period ending July 31, 1955. This contest was described in the February, 1956, issue of the CONCRETE MANUFACTURER, page 182. The list of winners in the three production categories and illustrations of the bronze plaques and certificates of achievement presented to the accident-free plants were also included in that issue.

Contestants in this competition were judged on a company basis, winners being declared in each of the following categories:

The Class A Award, for plants having an annual production of over 5,000,000 8-in. equivalent units, was presented to Eby Scheer, superintendent, Geist Builders Supply Company, Cleveland, Ohio.

The Class B Award, for plants producing between 1,500,000 and 5,000,000 units, was won by the Palmetto Quarries Company, Columbia, S. C., and was accepted by M. K. Corley, plant superintendent.

The Class C Award, for plants producing less than 1,500,000 units annually, was won by the Fischer Lime and Cement Company, Memphis, Tenn., and was accepted by W. A. Carter Sr., manager of the concrete products division of the company. This was the second successive year this award had been won by Fischer Lime & Cement.

In addition to the bronze trophies awarded the three companies, each eligible employee of the winners will be given a personal gift. The winners were selected on a basis of manhours worked, plus production in units for the period involved. The N.C.M.A. Certificate of Achievement was presented to 39 other plants which had completed the contest year without a single lost-time accident. Of these 39 plants, 14 had completed two or more accident-free years.

Presentation of trophies in the second annual N.C.M.A. safety contest: Henry Quaritius, chairman of the accident prevention committee, gives award plaque to: Eby Scheer (right), Geist Builders Supply, Cleveland, Ohio (Class A); M. K. Corley (below, left), Palmetto Quarries Company, Columbia, S.C. (Class B); W. A. Carter Sr. (below, right), Fischer Lime and Cement Company, Memphis, Tenn.

Left: Norman H. Withey, Madison, Wis., who presented a paper on the use of fly ash.

Right: Members of the panel on drying facilities (left to right): Ralph Reiner, Cleveland, Ohio; Verne Frese, Seattle, Wash.; and Benjamin Wilk, Detroit, Mich., who also acted as moderator.

Mr. Quaritius emphasized the need of a comprehensive training program on the part of all producers, to reduce hazards in plants. Last year 91 plants participated in the contest—20 percent more than in the previous year. The individual production rate of these plants is given in a table in the February issue. Any plant can be compared with the average rate for other plants in any size category, to determine its relative efficiency in preventing accidents.

Fly Ash Use

One of the most outstanding papers of the meeting was presented by Norman H. Withey, technical consultant, Madison, Wis., who spoke on the use of fly ash in block mixes. Numerous manufacturers are effecting substantial savings by replacing a portion of the cement with fly ash. Mr. Withey discussed the requirements for fly ash and its proper use. He defined fly ash as the finely divided powder collected by precipitators from flue gases of coal-burning boilers.

To be acceptable for use in concrete or concrete products, fly ash must contain a total of at least 70 percent silicon dioxide plus aluminum oxide plus iron oxide. It is highly pozzolanic and will react chemically with lime freed during the hydration of portland cement to form compounds having cementitious properties. At ordinary room temperatures, this pozzolanic action is generally slower than cement hydration, but at elevated temperatures action is greatly accelerated. The temperature of curing block has an important influence on the amount of fly ash that can be used in a mix without reducing strength.

Mr. Withey described a series of tests recently conducted by Professor G. W. Washa at the Materials Laboratory of the University of Wisconsin. These tests were designed to provide information on the effects of various amounts of fly ash in various block mixes and also on the effects of various curing procedures on the flexural strength and toughness properties of block-type concrete. A full description of these tests is presented in the February issue of the CONCRETE MANUFACTURER, page 165. The article includes significant conclusions reached by Professor Washa.

Drying Facilities

A panel discussion of *Accelerated Drying Facilities, Methods and Costs* was presented by three members at whose plants different methods of drying blocks are used. Members of this panel were Benjamin Wilk, Standard Building Products Company, Detroit, Mich., Verne Frese, Layrite Concrete Products of Seattle, Inc., Seattle, Wash., and Ralph Reiner, Cleveland Builders Supply Company, Cleveland, Ohio. Each described the facilities and operations of his firm and presented applicable cost data.

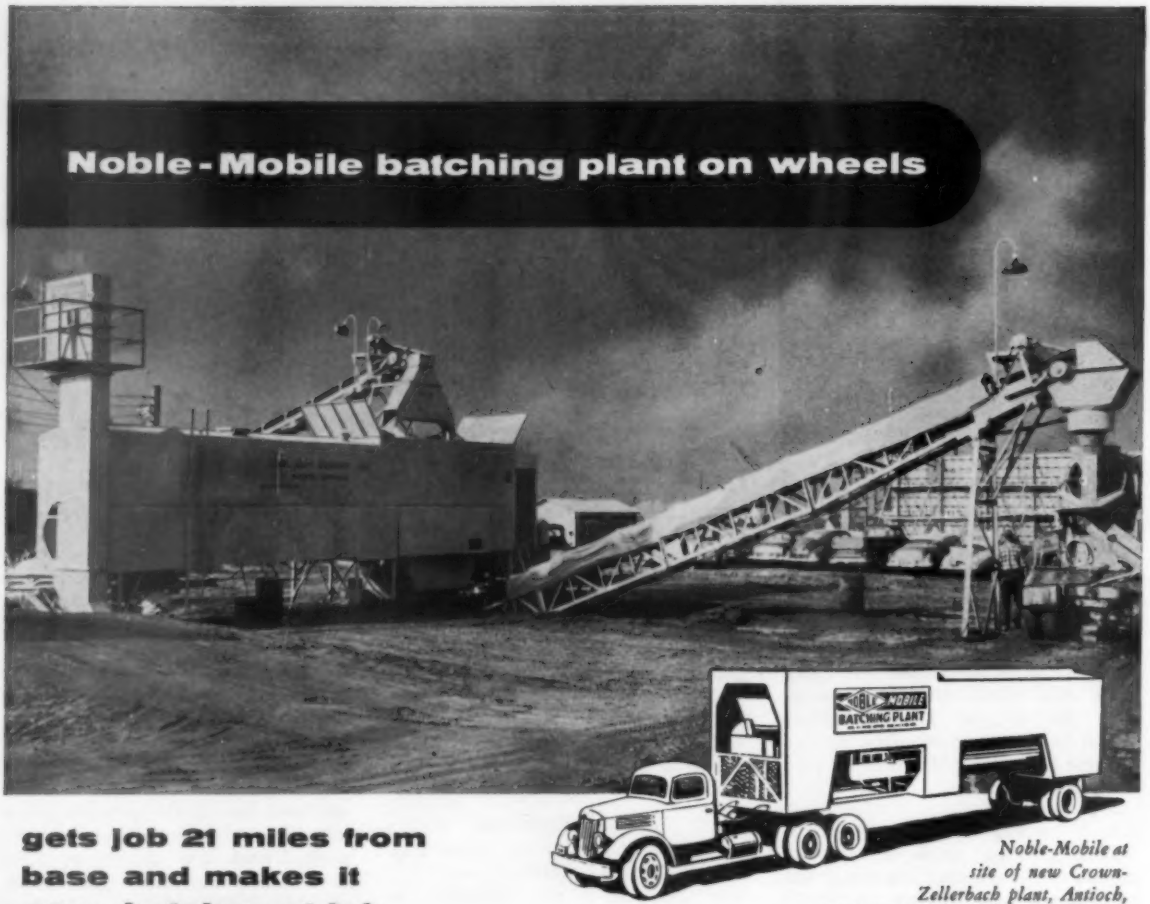
Mr. Wilk uses hot air for drying blocks in his plant. This air enters the system at 300 deg. F. and has a temperature of 200 deg. F. on its return. Fuel oil is now being used, but later on the use of natural gas is expected to reduce costs of drying about 50 percent. The blocks are cubed for this drying, 1½-in. air space being left between the units. A control panel is installed which does not require the presence of an operator. All recordings are examined from time to time to check on the temperatures, volumes of air, etc. Mr. Wilk said that no tests of strength of such units are available as yet, but these are being tabulated in an effort to reach certain conclusions as to the relative efficiency of the method of drying. The drying system as now installed cost about $22,000, but does not have sufficient capacity. If it were expanded to the proper size, the cost would approximate $40,000.

Mr. Frese uses hot, dry air for

(*Continued on page* 247)

A group of the members enjoy a tour on the Mississippi River, by courtesy of the Commissioners of New Orleans.

Noble-Mobile batching plant on wheels



gets job 21 miles from base and makes it pay...batches at job site with Noble-Mobile

Noble-Mobile at site of new Crown-Zellerbach plant, Antioch, Calif. 10" wheels dismounted for use on truck mixers. Supplier: H. W. "Heine" Gentry Co., Walnut Creek, Calif.

Hauled along highway like semi-trailer • Set up in one day—no field wiring, footings or crane time required on base plant • Aggregates charged with front end loader, crane or conveyor • Bulk cement utilized ...batched automatically • Excellent quality control Maximum production from mixer trucks—short hauls, more yards per day • Production capacity 60 to 100 yards per hour • Covered by patents pending

NOBLE BATCHING PLANTS

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Staff Expansion Announced For Master Builders Co.

S. W. Flesheim, chairman of the board of The Master Builders Company, division of American-Marietta Company, has announced the expansion of the company's research laboratory administrative and supervisory staff.

Stephen W. Benedict was elected vice-president of research and engineering; Herbert K. Cook was promoted to the post of director of engineering and Thomas M. Kelly to director of research; and Perry H. Peterson was named assistant director of engineering.

Dr. Edward W. Scripture Jr., who has been associated with Master Builders since 1930, is retiring as vice-president in charge of research, but he will be retained in the capacity of consultant. Widely known for his research in the field of concrete and mortar, he is the author of many papers dealing with this field.

Mr. Benedict joined Master Builders as director of research in 1948. A graduate of the University of Illinois in civil engineering, he served as materials research engineer with the National Advisory Committee for Aeronautics. He was materials engineer for 10 years with the National Bureau of Standards in the cement and concreting materials section.

Mr. Cook became a member of Master Builders' research laboratory staff in 1954. He was previously chief of the concrete division, Waterways Experiment Station, Corps of Engineers United States Army, Jackson, Miss. He is nationally known as a concrete research engineer and is the author of technical papers on properties and methods of testing concrete.

Mr. Kelly, a graduate of Union College in 1933 in civil engineering, also joined Master Builders' research laboratory staff in 1954. Previously he was masonry material research engineer in the National Bureau of Standards for ten years. He was also field construction engineer for the Corps of Engineers on the Detroit, McNary, Dorena Lookout and Dalles Dams.

Mr. Petersen, a graduate of Cooper Union Institute of Technology in civil engineering, comes to Master Builders from the U. S. Naval Civil Engineering Research and Evaluation Laboratory, Port Hueneme, Calif., where he served as supervisory materials engineer, and director, Materials Division, Structures and Research Department.

N.C.M.A. Convention

(*From page* 245)

curing blocks. In his company it is felt that drying cannot be done efficiently by exposing the units to air storage mainly because of the high humidity in Seattle air. The units are subjected to a water spray for ½ hour in the process of curing. The products of combustion are circulated, so that there are no stack or boiler losses. The system used does not require a licensed boiler operator. Oil was first used, but this produced a staining of the units, so that a temporary switch was made to butane fuel. The company is now using natural gas for curing heat.

Ralph Reiner stated that in the past his company stored units under covered storage sheds for a period averaging about 45 days. This required far too much storage area and forced air drying was considered the solution to the problem. Their hot air dryer is 9 ft. in width and 72 ft. long, and has a capacity of 5,760 8-in. equivalent units. The capacity of the heater used is 1,400,000 B.t.u.'s per hour. This heat is circulated by means of a 5-hp. suction fan, the air entering the kiln through an air chamber at the bottom.

A grid floor of concrete beams allows the air to enter the kiln through transverse openings spaced so that the openings vary from ½ in. at the front, to 1 in. at the middle and to 1½ in. in the last bay of the heater room. The heater building has a corrugated Transite roof under the return flues built along the top of the chamber. Cubing of units is done by means of a Towmotor lift truck. The control of the heat is entirely automatic, a cycle of 2 hours being followed for loading and unloading and 10 hours for actual drying of units. A temperature of 230 deg. F. (at the end of the heating chamber) is maintained, with a 10-deg. F. variation as now controlled.

Mr. Reiner presented a series of slides showing costs of the drying installation. These included the following: Cost of the dryer (material and labor), $10,000; cost of one cycle of drying, $56.50, which included fuel, labor of loading, unloading and operating kiln; and total cost per block—$0.0148—based on drying 750,000 units per year.

Atom Bomb Tests

Mr. Smithwick presented certificates of appreciation to the four members whose companies had participated in providing the concrete block test houses at Yucca Flats, Nev., erected to test the effects of the atomic blast early in May, 1955. These members were A. G. Streblow, Basalt Rock Company, Inc., Napa, Calif., Elmer A. Peterson, Rocklite Products, Ventura, Calif., Cedric Willson, Texas Industries, Inc., Dallas, Tex., and B. F. Park, Buildex, Inc., Ottawa, Kans. The first three men were appointed project consultants, and Mr. Park was an official observer of these tests. The detailed account of the performance of the concrete units used in the construction of the houses was given in the CONCRETE MANUFACTURER, July, 1955, page 254.

S. W. Benedict

Dr. E. W. Scripture Jr.

H. K. Cook

P. H. Petersen

T. H. Kelly

PRESTRESSING— A NEW AGE IN CONCRETE

By H. H. EDWARDS
President
Lakeland Engineering Associates, Inc.
Lakeland, Fla.

IN a free competitive economy there are only a few motivating forces which will advance an industry. One of these forces is the ability to produce a better product and another is competitive pricing. Due to these two forces, a better product and competitive pricing, concrete in roof and floor deck construction is soon to take over as a major material of deck construction in contrast to its relatively minor role of the past.

This change is coming as a result of the concrete industry's ability to furnish a better product at a competitive price. Precasting and prestressing are the keys to cost and quality. Precasting brings mass production under controlled central manufacturing plant conditions. Prestressing brings an entirely new conception in concrete design. It enables us to have long spans, resilient and flexible members, light sections, and the ability to take terrific overloads and recover without structural damage.

The trend to precast and prestressed concrete will spread to all deck construction. It will be used in warehousing, schools, store buildings, and industrial construction. Eventually, it will find its way into home construction on a mass production scale.

Concrete as a deck construction material has always been highly desirable. Its principal handicap, especially for roof construction has been cost—the cost of on-the-job forming, pouring, finishing, and stripping. It has also had the limitation of requiring too much material for the longer spans.

Precasting, together with prestressing, has changed the concrete cost picture materially. It is now within the competitive range of a great many other materials. Concrete is a desired construction material and will be specified and used in large volume if it can be economically justified. Precasting gives the cost justification.

If prestressing had not entered the picture, we would still see a strong trend to precasting. Now with prestressing, the trend will become a landslide because in addition to its superior qualities, prestressing brings a further economy to precasting in the savings of material, both steel and concrete. Prestressing also enables precasting to be offered in spans that could never be afforded for poured-in-place reinforced concrete designs.

Economical spans in precast prestressed concrete will be limited only by the ability to deliver and erect. Both roof and floor deck in prestressing improve their competitive position for spans above 30 ft. Forty- to 60-ft. clear spans are now quite common as a precast design. When slabs are made as standardized items in mass production, they can be competitive with steel and timber construction.

Forming expense for poured-in-place concrete is usually large, often running above $40 per cu. yd. of concrete poured. The central casting plant will have a large initial capital investment in permanent steel forms. However, these forms are standardized and are designed to produce several different products. A typical double tee 400-ft. long form will cost better than $15,000 installed, but this form can be amortized over 1,000,000 sq. ft. of product. Therefore, the forming cost per cu. yd. of concrete poured will be only a fraction of that for formed-in-place concrete construction.

Efficient material-handling, job specialization, repetition, standardization, and continuity of employment all favor the central casting plant. The concrete products plant will gradually grow to become one of the giant manufacturing industries, rivaling steel and automobile manufacturing for size and employment.

Design potentials are no less spectacular than cost reductions. Prestressing allows the use of the entire cross section area of high-strength concretes. This high efficiency in the use of materials makes it possible to design a double tee concrete roof slab capable of 50-ft. spans having an overall depth of only 14 in. and requiring only 0.011 cu. yds. of concrete per sq. ft.

Resiliency can be achieved in concrete through prestressing. A load deflection and recovery test must be witnessed for one to realize these wonderful new properties which concrete takes on when pretensioned. Brittleness and the possibilities of sudden failure can be very remote in certain prestressed designs. The T section prestressed is characteristically a low stress design. Both top

Prestressed double tee roof slabs used in an exterior covered walkway on an elementary school at Stuart, Fla.

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and bottom fiber stresses in concrete can be low and still result in good efficiencies and long spans. Overloads merely increase deflection, which serves as a warning of overload. Even at ultimate load, the double tee does not collapse. It will even recover when the ultimate load is removed.

Safety is one of the outstanding features of the prestressed T section. Bending moment stresses in the concrete due to live and dead load are extremely small. The addition of a superimposed load on the joist actually decreases the maximum fiber stresses in the concrete. It is impossible to cause a bending moment failure of the joist from a uniformly distributed overload or a concentrated mid-span overload without first showing a sizable deflection, thus giving a warning of the overload condition.

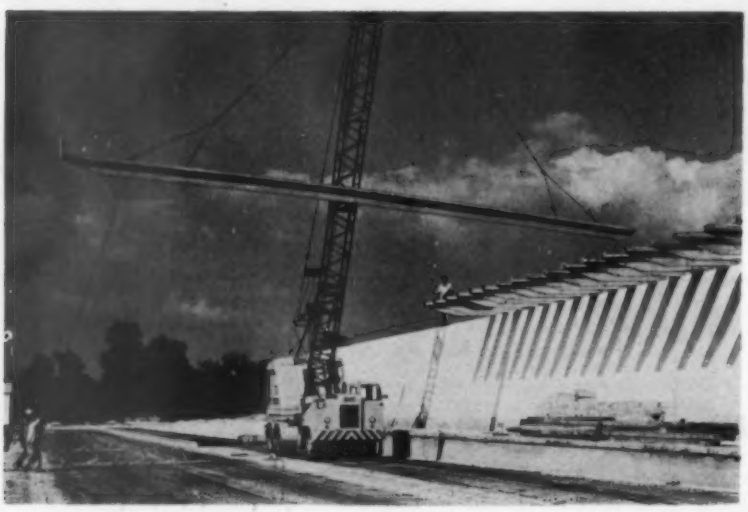
Recovery after overload is a characteristic of a prestressed joist. For example, an overload of three times the design load on a 40-ft. joist will show a deflection of 4 to 6 in. and yet the recovery will be better than 92 percent. There is no tendency to buckle on these overloads. The joist at either dead loads or dead and live design loads is free of tensile cracks. The first tensile crack usually shows up at dead load plus 1¼ (or greatter) design live load. If tensile cracks should develop from an overload, they will close when the load is removed.

Diagonal shear stresses are reduced by prestressing. In an ordinary beam the diagonal shearing force is a result of vertical and horizontal forces. Prestressing introduces a horizontal force which gives compression and opposes the normal tensile horizontal force, and the result is a reduction and a change of angle of diagonal shear.

Continuity in beam design is quite feasible in a long line pretensioning operation. Prestressing steel may be draped or sloped as desired. This is of great value to the designer, for instance in cantilever construction. The double tee may be cantilevered out as much as 20 ft. Sloping strands will become standard design procedure for all central casting plants. This procedure gives control of camber and lower concrete stresses, and reduces prestressing steel requirements. Concrete is surely entering a new age, with reduced costs and a superior product made possible through precasting and prestressing.

All concrete in the T. G. Lee Dairy, Orlando, Fla., is precast and prestressed. The 2-story columns are cast with paunches at second floor, which uses a double tee with a 2-in. topping. The same member of 38-ft. span is used on the roof.

A fire of undetermined origin recently destroyed a mixing bin at the Capitol Concrete Company's plant in Jacksonville, Fla.



Erection of 60-ft. long tee beams on a warehouse at Lakeland, Fla. This beam furnishes an 8-ft. cantilever over the loading platform.

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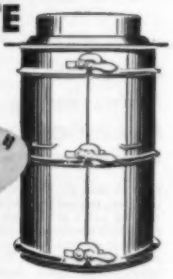

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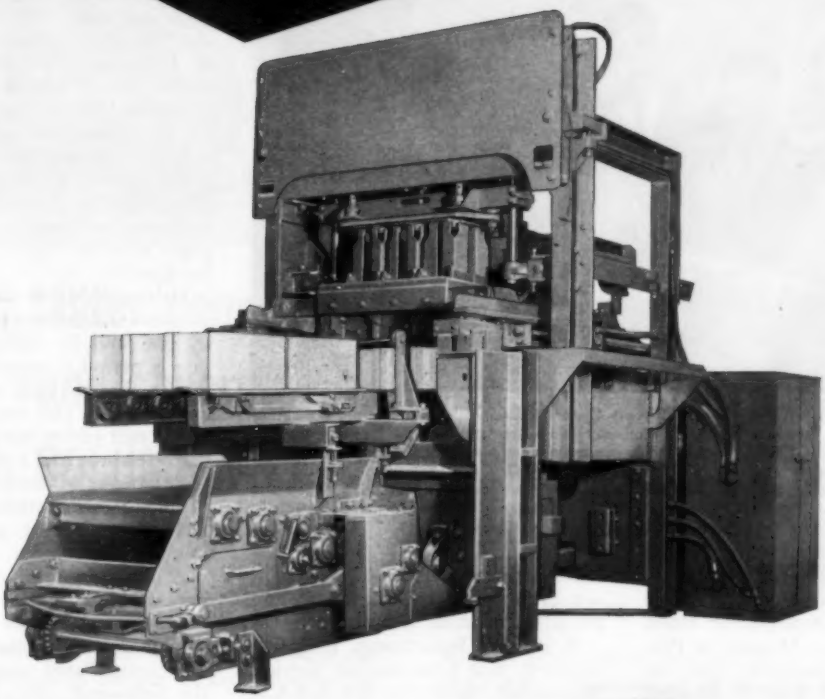

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Concrete Drain Tile Makers Meet at Purdue University

A group of those who attended the Mid West Concrete Drain Tile Manufacturers meeting at Purdue University, left to right: R. E. McKean, field engineer, Portland Cement Association, Indianapolis, Ind.; Keith W. Beauchamp, irrigation engineer, S.C.S., Milwaukee, Wis.; John G. Sutton, drainage engineer, S.C.S., Washington, D.C.; J. J. Seale, Concrete Conduit Company, Colton, Calif.; Philip W. Manson, professor of agricultural engineering, University of Minnesota, St. Paul; Fred W. Blaisdell, Agricultural Research Service, Minneapolis, Minn.; Thomas K. Breitfuss, American Concrete Pipe Association, Chicago.

TWO important research discoveries were revealed at the First Annual Mid West Concrete Drain Tile Manufacturers Meeting at Purdue University, Lafayette, Ind., on January 26 and 27. Fred W. Blaisdell of the University of Minnesota showed evidence that there is no essential hydraulic difference between lines with laterals tied to mains at right angles and lines with laterals brought in at angles of from 15 degrees to 75 degrees according to old conventions.

Dalton G. Miller, consulting engineer, St. Paul, Minn., showed two pieces of drain tile both meeting all A.S.T.M. test requirements, including strength and absorption. These tile were then subjected to an internal water pressure test not called for in the specifications. One tile held 100 p.s.i. pressure several minutes without any signs of leakage. The other leaked exceedingly at a pressure of only 5 p.s.i, indicating that present tests don't tell the full story.

Several other papers were presented to the meeting, which was jointly sponsored by the American Concrete Agricultural Pipe Association and the Agricultural Extension Service of Purdue University. Henry N. Luebcke discussed the interrelationship between highway and agricultural drainage. His talk was based on experience in the construction of the Ohio Turnpike, which crossed several thousand acres of farmland, necessitating provisions for continuous drainage of existing farms and for adjacent lands in future projects.

Keith W. Beauchamp, irrigation engineer, Soil Conservation Service, Milwaukee, spoke on the A.S.A.E. specifications for the design and construction of tile drains in humid areas.

John G. Sutton, drainage engineer, Soil Conservation Service, Washington, D. C., discussed *Progress in Obtaining Durable Concrete Tile Drainage Systems.* He related the early history and development of concrete drain tile and of eight factors which caused failures in the early days of manufacture and installation.

The tile testing programs in various states were discussed by Dalton G. Miller and Philip W. Manson of the University of Minnesota. Willard A. Cutler of Michigan State University, Ben F. Muirheid of the University of Illinois, and R. H. Austin, S.C.S. engineer in Indianapolis.

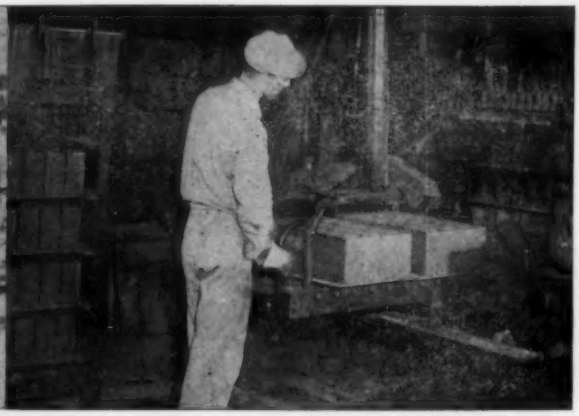
Homer Neisz, farm field representative, and R. E. McKean, field engineer for the Portland Cement Association, presented a comprehensive paper entitled *There's No Substitute for Quality.*

Dalton G. Miller told of the extensive tests which have been conducted by him and by Philip W. Manson over a period of more than 20 years on the effect of acids on various concrete mixes. The two tile samples mentioned earlier were each 6 in. in diameter and had a ⅝-in. wall.

Philip W. Manson, University of Minnesota, who returned from Korea recently, presented an informative talk on that country.

A lively discussion on manufacturing problems followed three 15-minute presentations by drain tile machinery manufacturers on the final afternoon. Panel members included the following: Mr. Sutton; Glenn Harriman, Indian Lock Joint Concrete Pipe Company, Lafayette, Ind.; Homer Peterson, Rockite Silo, Inc., Hutchinson, Minn.; Dalton G. Miller; and A. W. Schultz, Zeidler Concrete Products Machinery Company, Clear Lake, Iowa.

In this group were (left to right): Howard F. Peckworth, managing director, American Concrete Agricultural Pipe Association, Chicago; Henry N. Luebcke, S.C.S., Wapakoneta, Ohio; Homer Neisz, farm field representative, Portland Cement Association, Indianapolis, Ind.; Dalton G. Miller, consulting engineer, St. Paul, Minn.; George Spencer, head, Department of Agricultural Engineering, Purdue University; and Willard A. Cutler, extension agricultural engineer, Michigan State University, East Lansing.



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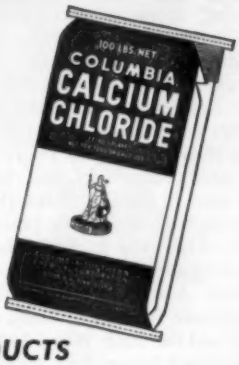

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HOW TO REDUCE A DELIVERY HAZARD—BLOCK SPILLAGE

USUALLY the final operation of concern to the block manufacturer is the delivery of the units to the job site. Delivery is generally made in company-owned and operated trucks, or by a hauling contractor under special agreement with the company. In either case the producer may be liable to lawsuit for any public or personal damages resulting from delivery.

A number of accidents have occurred when block fell from moving trucks; these could have been avoided by the observation of proper loading and securing practices. Proper loading technique will insure safe delivery of block for short distances on smooth roads; long hauls and rough pavement require the use of extra precautions, such as binding the load to the truck bed. Here are a few suggestions for safe practice:

1. The truck bed should be cleaned of all loose stone and debris before loading. This will insure maximum friction between the truck bed and the load. Wood beds tend to hold block better than metal.

2. The load should be tilted inward toward the truck's longitudinal center line. If trucks are hand-loaded, this tilting can be accomplished by placing wood strips along each side of the truck bed.

3. Block cubes should be tightly stacked. Hand stacking of top outside block will improve stability of loose cubes. Wood stakes or pipes placed in cores of outside block will hold top courses.

Fig. 1—These shots illustrate the chain-and-angle method of securing concrete block.

4. Block cubes should be spaced close together to minimize shifting. Partial loads should be placed well forward on the truck bed as the rear of the truck is subject to the greatest amount of shock and whip.

5. All available end and sideboards should be employed. The tailgate of dump trucks should be raised when they are used for delivery.

6. The stability of the load should be checked by the driver prior to and during delivery. Trucks should be equipped with side-mounted rear view mirrors on each side. They should be stopped and loads should be inspected and readjusted at periodic intervals when total haul exceeds 10 miles.

The load should be secured to the truck bed by some satisfactory means during long hauls or over rough roads. Two possible methods of binding the load to the truck are shown in the accompanying illustration. The method shown in Figure 1 can be duplicated very economically. Necessary equipment consists of 4- by 4-in. angles of wood or steel, lengths of ⅜-in. chain equipped with swivel heads at each end, and chain takeup or booms. Angles are cut to some convenient working length (two cubes, or about 8 ft. in the illustration.) Chains are cut sufficiently long to reach across the top of the cubes and hook onto each side of the truck. The loaded truck is stabilized by first placing the angles along each side of the top courses, putting chains in position across the top of the cubes, and tightening down the load by means of the chain takeup. It is impossible to take up the chain enough to keep block from shifting somewhat enroute. For this reason the chains should be retightened after the truck leaves the yard. On long hauls inspection and readjustment of chains should be made every five or ten miles, depending on road conditions.

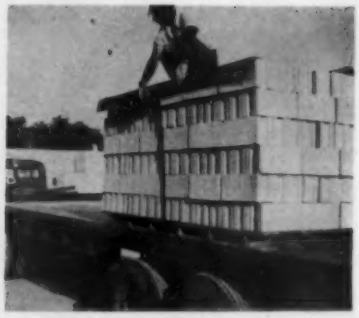

Fig. 2—The canvas belt method of securing concrete block.

The method shown in Figure 2 has been successfully used for stabilizing low-stacked cubes. This system requires two pieces of 12-in., 3-ply canvas belting the length of the truck bed, two front-corner steel guide posts with built-in rollers, a belt-tightener, and several guide posts along each side of the truck. The method appears to be easier and faster to secure than the method shown in Figure 1 but costs a little more to install. The addition of a second set of belts above the one shown in the figure would adapt this system to higher loads.

The suggestions and methods

(*Continued on page* 261)

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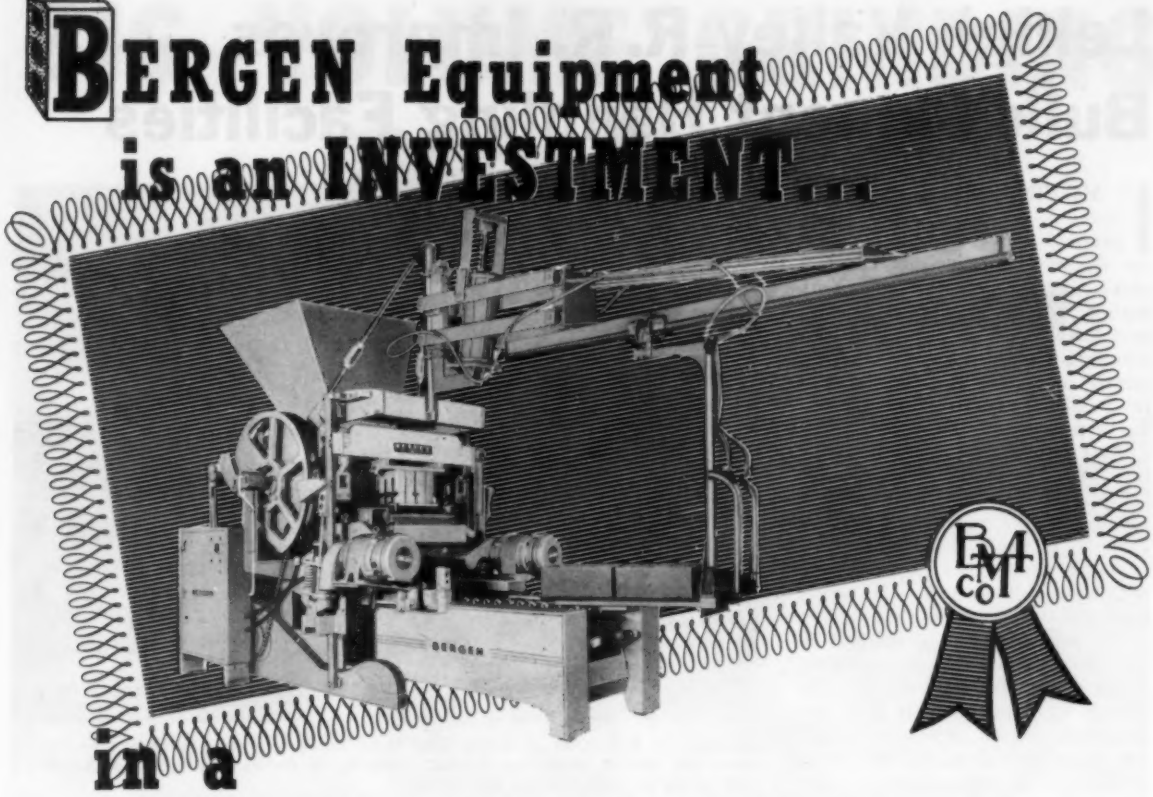

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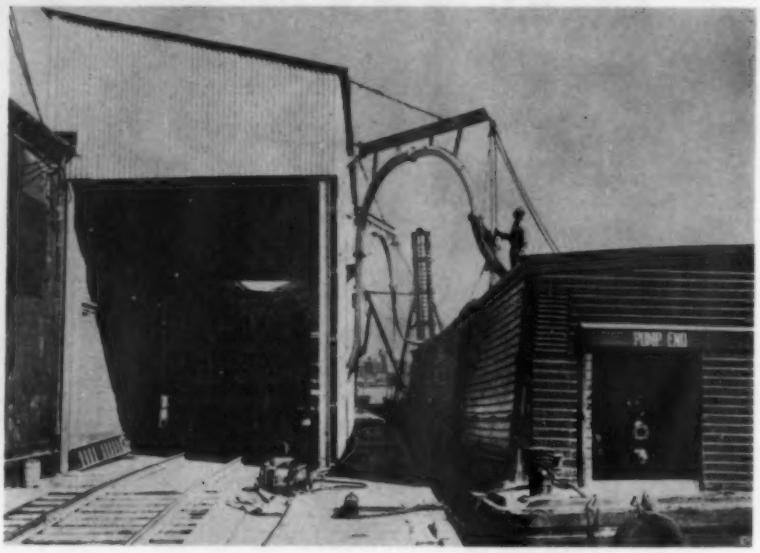
Lehigh Valley R.R. Improves Bulk Cement Handling Facilities

IN MOVING more than 625,000 tons of cement annually from railroad hopper cars into barges for delivery to ready-mix concrete plants in the vicinity of New York harbor, the railroads serving that port have made an impressive contribution toward meeting the constantly increasing demand for this product by the construction industry. To keep pace with the growing trend to bulk handling of cement, one of these carriers—the Lehigh Valley Railroad Company—has installed a semi-pneumatic system at its Jersey City, N. J., facilities that enabled it to move four times more cement with covered hopper cars and barges since 1954 than previously.

The material-handling method installed—a Fuller-Kinyon pumping system— provides for unloading the cement from hopper cars at a pier and conveying it into barges, while for unloading at its destination a Fuller-Kinyon remote-control carloader is carried on each barge. Beneficial results of the system are reported to include greater handling speed, lower costs, and faster turnaround for cars and barges. The favorable effect on time and expense is illustrated by the fact that in the last full year of operation with another method of handling, the Lehigh moved the contents of only 354 of the 70-ton hopper cars into barges, while in the first full year of operation with the new system 1,429 cars were handled.



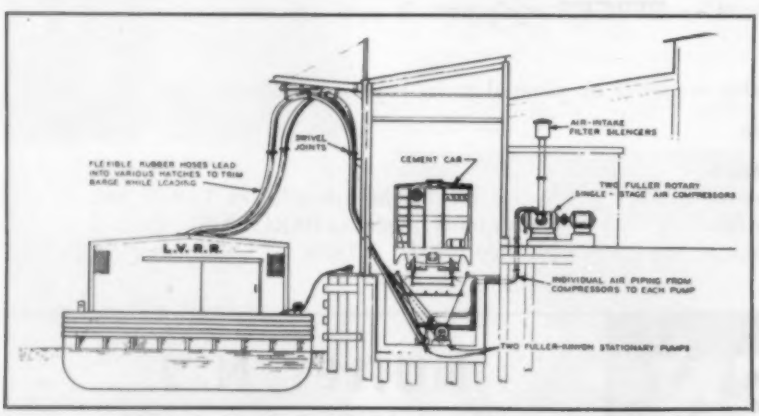
Lehigh's Pier B facilities at Jersey City, N.J. The hopper car is spotted over the pit, where two cement pumps are located. Swiveling of the boom-supported discharge line puts all barge hatches within easy reach.

All of the cement loaded into barges from the Lehigh's Pier B facilities at Jersey City comes from mills in the Lehigh Valley district of Pennsylvania. In addition to its own stock of 591 covered hopper cars—each with a 400-bbl. capacity —the railroad owns eight 500-ton barges which are converted general cargo vessels. They are plywood lined, and have removable partitions for the separation of different types of cement.

Upon arrival from the producing district, the hopper cars are hauled from the Oak Island yard in Newark to the Jersey City yard, which is near the barge loading pier. From the latter yard cars are moved out onto the pier for spotting over an unloading pit.

As installed on the pier, the Fuller-Kinyon conveying and loading system consists of two Type H stationary pumps mounted in a pit below the pier railroad tracks, two 1-120 rotary single-stage multivane compressors (each with a capacity to furnish 614 c.f.m. of air at a pressure of 12 p.s.i.), and two 8-in. discharge lines. The compressors, each of which is driven by a 40-hp. Westinghouse motor, are located in a small compressor house inside the pier building. This location assures that air drawn through filters above the compressor house will be comparatively free of dust, and will also have a lower humidity during damp or rainy weather. By using both pumps the loading rate from car to barge ranges between 900 and 1,000 bbl. per hour; and a 70-ton car can be emptied in 20 minutes. Should one of the two pumps go out, the remaining operable unit can continue the barge loading.

When the gates of the hopper car spotted over the pump pit are opened, the cement discharges by


FLEXIBLE RUBBER HOSES LEAD INTO VARIOUS HATCHES TO TRIM BARGE WHILE LOADING
SWIVEL JOINTS
CEMENT CAR
AIR-INTAKE FILTER SILENCERS
TWO FULLER ROTARY SINGLE-STAGE AIR COMPRESSORS
L.V. R.R.
INDIVIDUAL AIR PIPING FROM COMPRESSORS TO EACH PUMP
TWO FULLER-KINYON STATIONARY PUMPS

This diagram shows the arrangement of the semi-pneumatic system installed for unloading closed hopper cars and loading cement into barges at the pier. The system will unload and transfer 400 bbl. of cement from a 70-ton car in 20 minutes.

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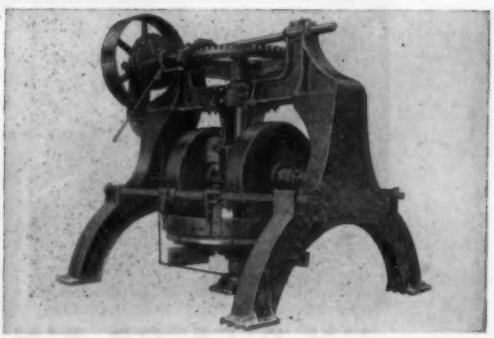
Huber-Warco Grinders range in capacity from 4 to 75 yards per hour. Whatever your capacity requirement, there's a Huber-Warco Grinder exactly suited to your type of aggregate. Ask for a non-obligating consultation with the Huber-Warco grinding specialist . . . write, wire or phone.



HUBER-WARCO NO. 9 GRINDER

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gravity into hoppers above the stationary pumps. From the pumps the material is transported through each of the two 8-in. pipelines that go out through the car shed to a point where they connect by swivel joints with two inverted "U" sections of pipe. The latter sections are supported by two swinging booms moored to the top of the car shed. These allow the discharge lines to be moved within easy reach of any hatch on the barges being loaded.

From the "U" sections the cement is pumped through flexible hoses to a pair of distributors that were developed by engineers of the Lehigh's marine department. These distributors were designed primarily to provide for easy trimming while loading, in order to keep the barges on an even keel. They consist of a metal gooseneck with a swivel ring to fit over a hatch opening. This accomplishes the confinement of dust within the hold and prevents the loss of cement. A grate in each distributor keeps out lumps and foreign material.

Inside and directly below the gooseneck there is a deflector that can be rotated by the swivel ring to control the direction of flow of the cement to any area of the compartment being loaded. Total conveying length is about 100 ft.

About six or seven cars are required to fill a barge although the latter are often moved with a cargo of about 280 tons, or four carloads. When a barge is loaded, the responsibility and expense for tow is assumed by the consignee, who hires Lehigh's tugs, or those of a lighterage company. If the railroad company's deepwater tugs cannot go all the way because of shallow water, the barges are turned over to tugs of an outside company for final delivery.

Each cement barge operated by Lehigh Valley carries a Fuller-Kinyon Type C remote-control unloader which is kept in the pump room at one end of the vessel. When the barge reaches its destination, the consignee uses this self-propelled portable pump to unload the cargo. With power and compressed air furnished from the customer's plant the cargo can be pumped to storage ashore at the rate of 115 to 150 bbl. per hour.

For unloading, the inboard bulkhead of the pump room is removed and the unloader is moved directly into the cement cargo. A slowly rotating feeder disc (perforated to allow the cement to pass through and prevent the front end of the unloader from climbing the pile) transfers the material to a screw and pump line for transport out of the hold. A 500-ton barge loaded to capacity can be unloaded at a customer's plant in 18 to 24 hours.

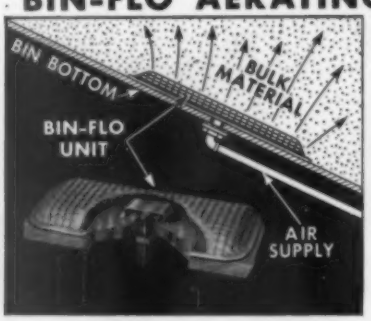
In addition to unloading its own cars for barge shipment from Jersey City, the Lehigh Valley also accommodates those of other railroads with its new facilities. The barges of commercial lighterage companies are also often loaded at Pier B. Cement barged from this point is consigned to such points around New York harbor as Newark, Bayonne, and Perth Amboy, N. J.; East River, North River, Harlem River, and Bronx River plants; Westchester Creek; Gowanus Canal, and Coney Island, Brooklyn.

J. E. Kelly Named to Staff Of Unit Masonry Association

James E. Kelly has been named secretary-manager of the Unit Masonry Association, according to an announcement released in Kansas City, Mo.

Mr. Kelly was formerly features editor of *Mid-West Contractor*, a regional construction publication. The Unit Masonry Association, which has a membership of over 800, was formed to promote masonry construction in the Kansas City area.

BIN-FLO AERATING UNIT



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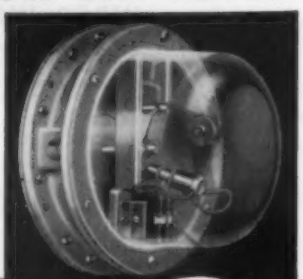

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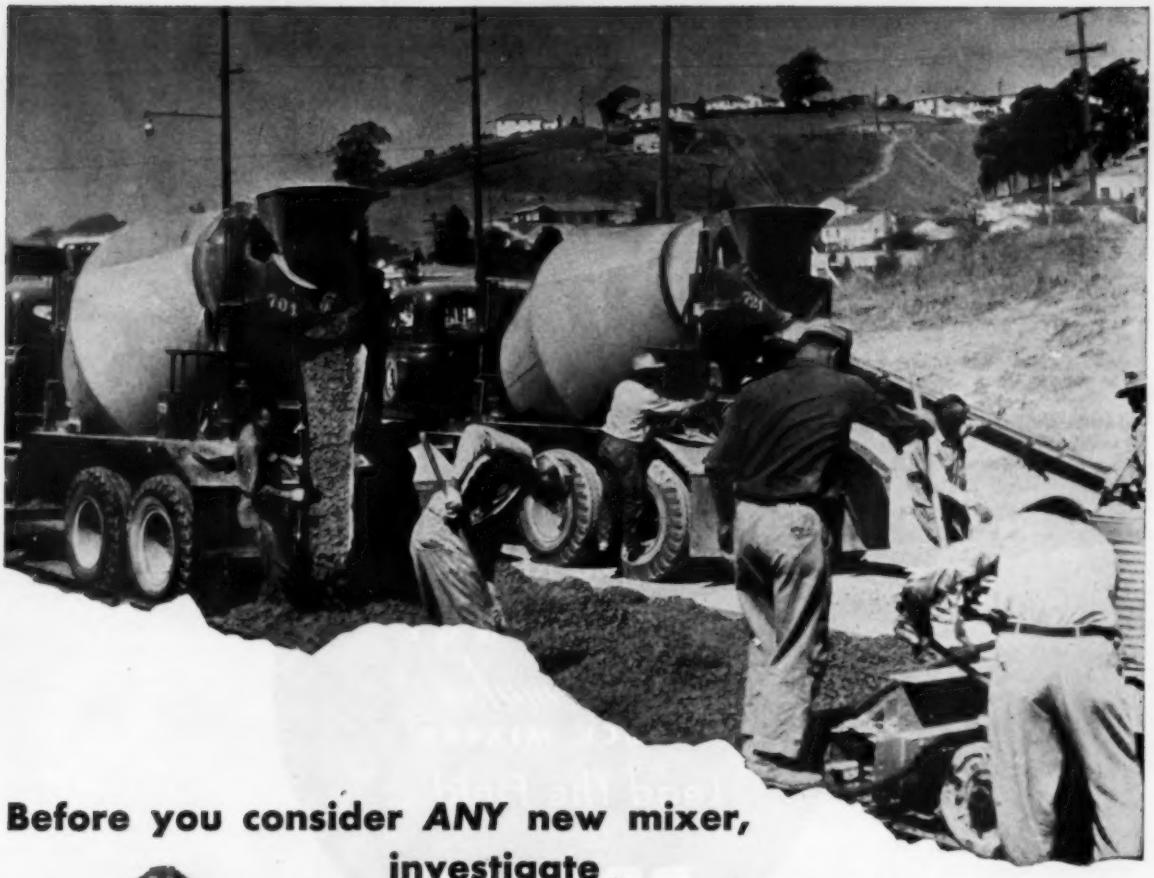

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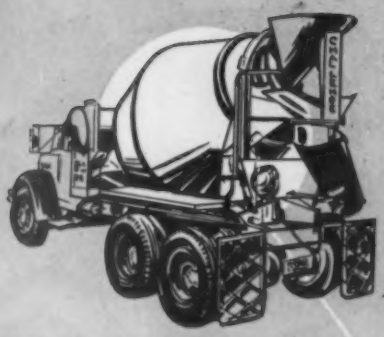

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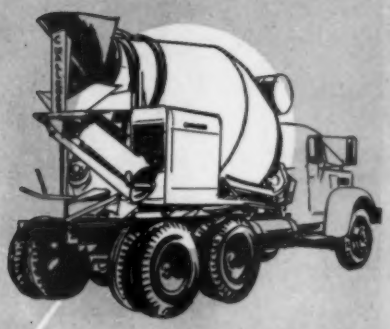
5 • 5½ • 6 • 6½ • 8 Yard Sizes



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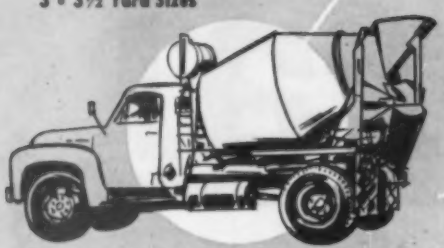
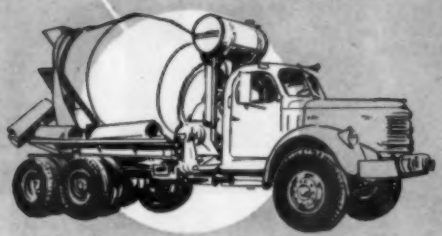


ENGINE-TAKE-OFF MODELS IN
5 • 5½ • 6 • 6½ Yard Sizes



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Rx Ready-Mix

(*Continued from Page* 222)

On winter construction the Committee recommended—(1) that concrete made with straight Type I cement should be initially moist-cured at 70 deg. F. for at least 3 days; and (2) with blended cement mixes which do not develop early strength as rapidly as straight cement mixes, the minimum time of curing at 70 deg. F. should be 5 days. After such initial periods of moist curing, the concrete should be protected from freezing until it is estimated that two-thirds of the designed compressive strength has been developed.

The foregoing recommendations of the Chicago Committee offer criteria for a ready-mix producer to consider in discussing advantageous cement or cement-blend mixes for individual projects.

Workability

(*Continued from page* 232)

an occasional determination of the unit weight of wet concrete. It is usually not necessary to entrain air in concrete produced from coated expanded-shale aggregate.

5. Crushed expanded-shale aggregate should be prewetted prior to handling and mixing. The extent of prewetting should be in accordance with the producer's recommendations. Prewetting methods should assure *uniform* moisture content of aggregate.

6. The weight of moisture in the aggregate should be determined and added to the converted dry weight used to represent the initial mix volumes. This weight of aggregate water should be deducted from the weight of water added to the mixer, as determined in the trial mix design.

7. Expanded-shale concrete does not require the same extent of slump as is required by heavyweight concrete to produce equal workability.

Block Spillage

(*Continued from page* 254)

given here are not necessarily complete nor the best possible means of stabilizing a block load. It is possible that some method unknown to the writer may be better than those presented. Anyone having knowledge of such a system is requested to contact the N.C.M.A. office. Through the exchange of ideas on accident prevention block producers can realize reduced accident costs, better employee and public relations, and increased efficiency. (This material was issued to members of the National Concrete Masonry Association as N.C.M.A. Safety Bulletin No. 4.)

Prestressed Concrete Inst. Holds 2nd Annual Convention

The second annual convention of the Prestressed Concrete Institute will be held on May 16-18, 1956, at the Hollywood Beach Hotel, Hollywood, Fla.

The first day will be devoted to panel discussions on materials, techniques, application, design, production, inspection and specifications. Panel members are engineers, architects, and producers from Florida, New York, Massachusetts, Pennsylvania, Texas, and California.

On the second day the group will make an inspection trip to examine structures in which prestressed concrete units were utilized, and visits to casting yards to observe the production of prestressed members.

One the final day technical papers will be read by W. E. Dean, Tallahassee, Fla.; T. Y. Lin, University of California, Berkeley, Calif.; R. W. Kluge, University of Florida, Gainesville, Fla.; H. J. Godfrey, John A. Roebling's Sons, Trenton, N. J.; W. J. Eney, Lehigh University, Bethlehem, Pa.; Curzon Dobell, Preload Engineers, New York, N. Y.; and Thor Germundson, Portland Cement Association, Chicago, Ill.

For further information write to the Prestressed Concrete Institute, P.O. Box 495, Lakeland, Fla.

Book on Masonry Available From National Lime Assn.

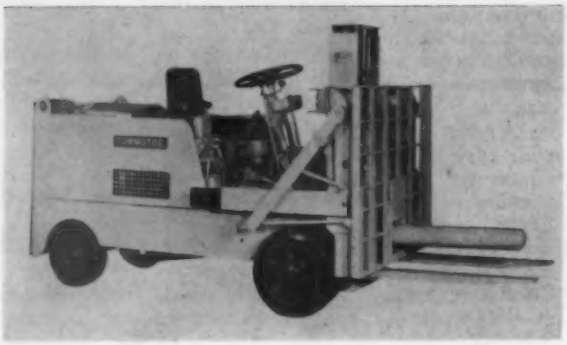
Exterior Masonry Construction is the title of a new book on the fundamentals of sound, watertight masonry. Authored by Walter Voss, professor emeritus, Massachusetts Institute of Technology, the volume covers mortar, masonry units, design, and good workmanship.

Mr. Voss is considered one of the outstanding masonry authorities, and until recently was head of the department of building engineering and construction at M.I.T. He has long been a writer and lecturer on various phases of construction and masonry.

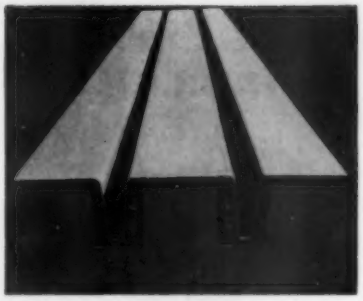
This work was written expressly for architects, masonry contractors, and engineering students. All the points vital to sound masonry practice are presented in a concise, understandable, and thoroughly authentic manner. The 70-page book contains 36 photographic and schematic illustrations.

Single complimentary copies may be obtained by writing directly to the National Lime Association, Washington 5, D. C.

CM New Machinery and Supplies



● Maximum speed and efficiency in the handling of open-center loads is possible by employing the combined utility provided by two lift-truck attachments now available as optional equipment on Towmotor Fork Lift Trucks. The two accessories are the unloader and the ram attachment. ← (101)



● Form-Crete permanent steel forms, for casting multi-purpose concrete products are now being made available by the Florida Division of Food Machinery and Chemical Corporation. Forms include the Double-T, bridge beams, square anr octagonal piling, hollow lintel, and solid lintel models. ↑ (103)

● Motor driven turntables with automatic push-button control are now being manufactured by the Columbia Machine Company. One, two and three rack models are available provide triple capacity while expediting exchange and cubing of concrete block. Racks may be loaded with green block in one position, while the second position is utilized for replacement of green block by cured units direct from steam rooms. The third position. may be used for cubing the cured block. → (104)

● The new Erie PC-series portable batching bins feature a greater truck clearance which gives 2 to 4 ft. more in width. Also, this new model gives an additional 30 to 40 ft. of platform space, allowing the operator more freedom of movement, while the checkered steel deck plates offers greater safety. The bins can be arranged for just aggregates, or for aggregate and cement, as well as with additional ground storage facilities. ↑ (102)

MARCH, 1956

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Use D-40 in block manufacture to—

INCREASE PROFITS

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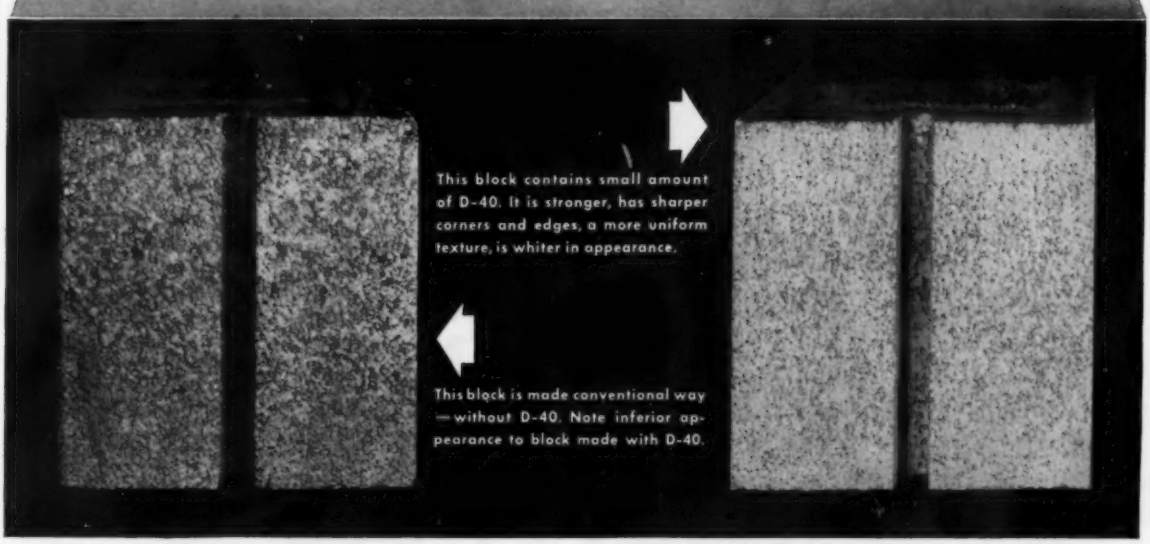
This block contains small amount of D-40. It is stronger, has sharper corners and edges, a more uniform texture, is whiter in appearance.
This block is made conventional way —without D-40. Note inferior appearance to block made with D-40.

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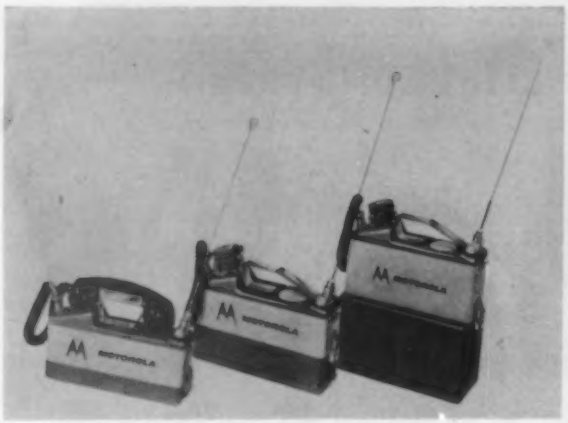
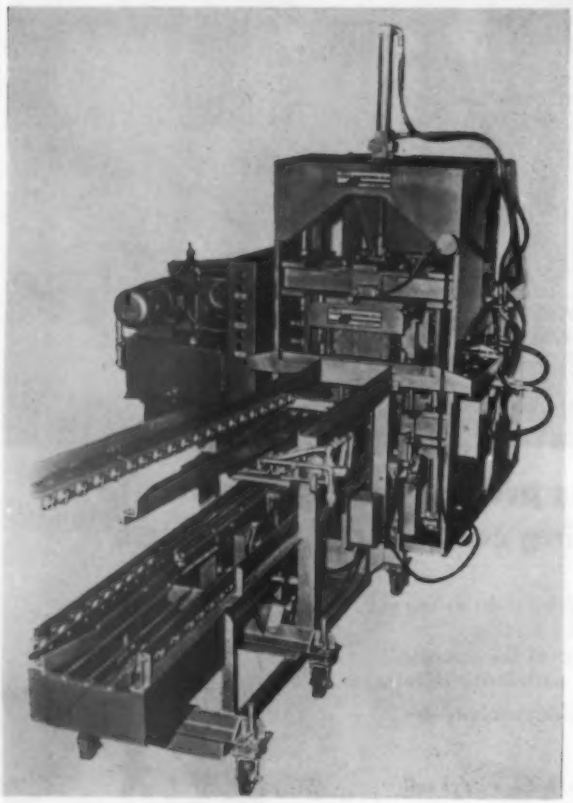
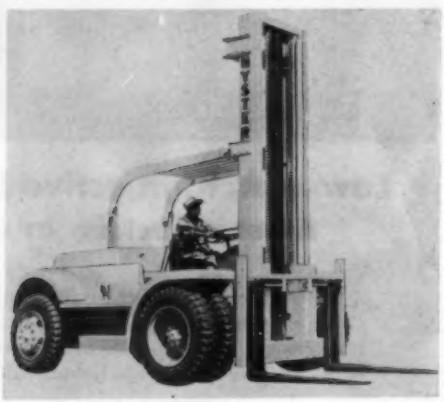


● Three Handie-Talkie portable radio-phones being manufactured by the Motorola Communications and Electronics Division are the lightweight, maximum portability version with handset microphone and dry battery power pack; the speaker and microphone unit with extra-duty dry battery power pack; and the high powered pack version with rechargeable nickel-cadmium wet-cell power pack. ▲ (105)

● Elwell-Parker Electric Company has introduced a 3,000-lb. capacity fork lift truck, the "Cargo-Scout," which handles maximum loads in confined areas. Compact in design, this 3,000-lb. capacity model has a shorter wheelbase and 360 degree steering. ▲ (107)



● Advanced features, formerly found only on larger machines, are now included in the FMC-10 single block machine manufactured by the Fleming Manufacturing Company. Blocks can be run extremely wet on this machine and 1,800 standard 8-in. or 12-in. units can be produced daily. An outstanding feature of the FMC-10 is the front pallet feeder and ejector. ▲ (106)



● The TC-200, newest in the line of lift trucks manufactured by the Hyster Company, makes available a lift with a capacity of 20,000 lb. at 24 in. load centers. Gasoline powered with the Hercules industrial engine, or the optional Perkins P6 diesel motor, the TC-20 has a speed of 20 mph in either forward or reverse. Compact design, 166½ in. long and 94 in. wide, the centerpoint steering allows a sharp outside turning radius of 179 in., creating a high degree of maneuverability. ▲ (108)

Minimum of Maintenance

Low in price

Over 60 units sold in New Jersey last year

Especially adapted to unloading under severe and uneven ground conditions.

Unnecessary to narrow down the size of your cubes—Will handle cubes which are six blocks deep. (12 blocks across width of body.)

Versatile—Will slide off many other bldg. materials ie. Brick—with or without pallets; any pallitized material etc; with the addition of side boards, cinders, sand, gravel etc; may be dumped.

BLOCK Slide-Off PAT. PENDING **UNLOADER***

FOR DETAILS AND PRICES, WRITE OR PHONE

ADAM BLACK AND SONS, INC.

300 Tonnele Ave. Jersey City, N.J.

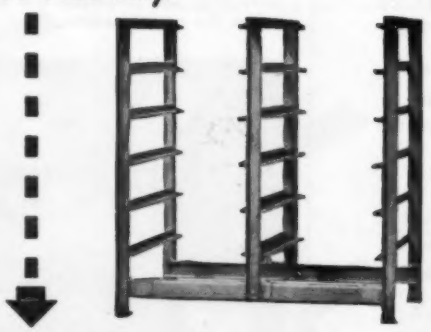
Journal Square 2-2120

COMMERCIAL BODY BUILDERS SINCE 1886

***Patents and Patents Pending.**

CHASE BLOCK RACKS, PLAIN STEEL PALLETS

Your best buy



Here's why • • • Standard style or specially designed, Chase racks meet your requirements. They're shipped painted and knocked down—assembly is easy—no special tools or welding needed. Chase experience means low prices and years of dependable service. Check Chase prices.

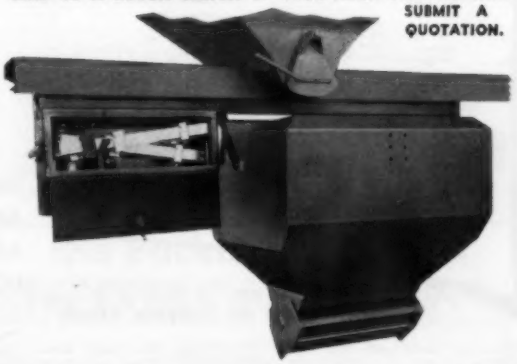
Chase FOUNDRY & MANUFACTURING CO.

2300 PARSONS AVENUE • COLUMBUS 7, OHIO

YOU CAN'T AFFORD

TO RISK MAKING A BAD PRODUCT TO KEEP FROM SPENDING ONLY A LITTLE ON WEIGHING EQUIPMENT

SEND US A ROUGH SKETCH OF YOUR PLANT AND WE WILL SUBMIT A QUOTATION.



GWYNNE Concrete Plants

BIN BATCHER

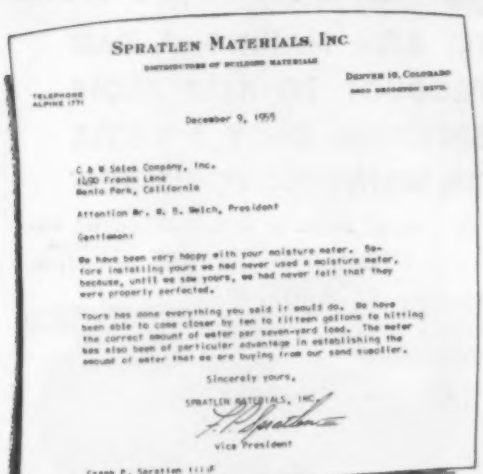
J. H. GWYNNE, INC. CAMDEN, OHIO

● Roura Iron Works, Inc., most recent development for block producers is a self-dumping hopper to carry materials to areas not reached by crane. The hopper can also be used as a grader to fill ruts and holes, and as a mobile trash unit to carry waste from plants. (109)

● Addition of only 2 to 4 percent of Losorb, the low-cost moisture-proofing additive, recently introduced by Pennsylvania Industrial Chemical Corporation, Clairton, Pa., permanently decreases by about 50 percent the permeability of concrete blocks, mortar, plaster, stucco, and concrete. Losorb also minimizes crack frequency, makes the mix more plastic and easier working, acts as a lubricant in molding and prevents stucco from drying and cracking. (110)

● Adam Black and Sons, Inc., Jersey City, N.J. has introduced the "Side-Off" block unloader which automaticallysunloads blocks and other building materials. A "floating" body hinge and retractable rear body fork follows the ground contour. (111)

Of course the Customer is Right!



SPRATLEN MATERIALS, INC.

DISTRIBUTORS OF BUILDING MATERIALS

Denver 10, Colorado

December 9, 1955

C & W Sales Company, Inc.
1490 Franks Lane
Menlo Park, California

Attention Mr. C. S. Welch, President

Gentlemen:

We have been very happy with your moisture meter. Before installing yours we had never used a moisture meter, because, until we saw yours, we had never felt that they were properly perfected.

Yours has done everything you said it would do. We have been able to come closer by ten to fifteen gallons to hitting the correct amount of water per seven-yard load. The meter has also been of particular advantage in establishing the amount of water that we are buying from our sand supplier.

Sincerely yours,

SPRATLEN MATERIALS, INC.

Vice President

Frank P. Spratlen III

The C&W ELECTRONIC MOISTURE METER has proved its value in many plants

Measures moisture of sand

INSTANTLY
ACCURATELY
AUTOMATICALLY
ECONOMICALLY

Write Today for Complete Details

Wherever installed, the C&W Electronic Moisture Meter has set records for controlling slump . . . removing "guesswork" from concrete production . . . eliminating "wet loads" . . . eliminating time and money wasted adding water and remixing dry loads.

Complete with instructions, $569.00 • F.O.B. San Francisco

C & W SALES CO., INC.

1490 Franks Lane • Menlo Park, California • Davenport 2-5416

We are Associate Members of The National Ready Mixed Concrete Association

NATIONAL READY MIXED CONCRETE ASSOCIATION NRMCA

● An "H_2O Meter" offered by the Sarasota Engineering Co., Inc., reportedly has the following functions in ready-mix installations: elimination of the need to stabilize moisture content by stockpiling; elimination of holding trucks for inspection of mix; elimination of trial and error method of batching water; and immediate adjustment of water for proper slump when moisture content of sand changes. (112)

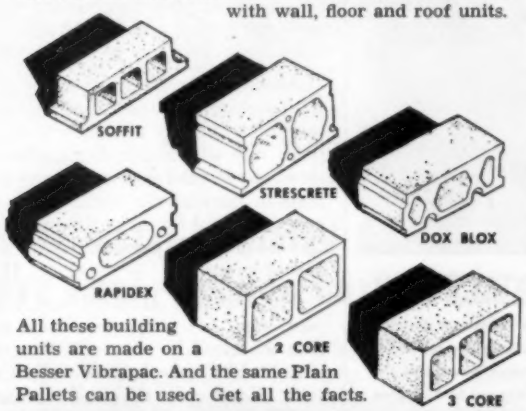
Go After the Entire Market!

Block for WALLS

Block for FLOORS

Block for ROOFS

Fire-safe walls? Of course! But floors and roofs should be fire-safe, too. Walls are full of openings (windows, doors, etc.), while floors and roofs are relatively solid. Actually, TWICE the volume of block is required for floors and roofs than is required for walls. So why not go after this profitable market? Supply customers with wall, floor and roof units.



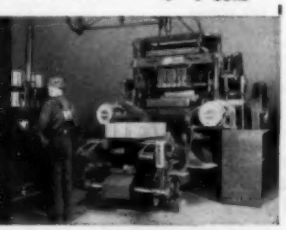
All these building units are made on a Besser Vibrapac. And the same Plain Pallets can be used. Get all the facts.

Write for Bulletin

BESSER COMPANY

ALPENA, MICHIGAN, U. S. A.

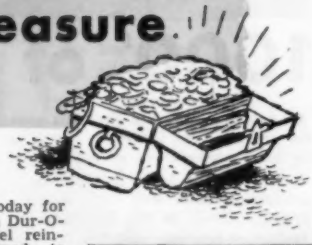
Complete Equipment for Concrete Block Plants



DUR-O-WAL®

Is Your

BURIED Treasure.



Phone, wire or write today for complete information on Dur-O-waL . . . the original steel reinforcing member designed to combat cracking of masonry walls. This sales-builder is a tie-in item, which steps-up volume and customer satisfaction. Get the facts now from Dept. 2S, Dur-O-waL plant nearest you.

Dur-O-waL lies flat in the mortar bed . . . . handles fast . . . . saves time . . . . and stores easily; compactly.

Butt-Weld • Trussed Design

DUR-O-WAL®

the Backbone of Steel for EVERY masonry wall

Dur-O-waL Div., Cedar Rapids Block Co., **CEDAR RAPIDS, IA.** Dur-O-waL Prod., Inc., Box 628, **SYRACUSE, N.Y.** Dur-O-waL of Ill., 119 N. River St., **AURORA, ILL.** Dur-O-waL Prod. of Ala., Inc., Box 5446, **BIRMINGHAM, ALA.** Dur-O-waL Prod., Inc., 4500 E. Lombard St., **BALTIMORE, MD.** Dur-O-waL Div., Frontier Mfg. Co., Box 49, **PHOENIX, ARIZ.** Dur-O-waL, Inc., 165 Utah St., **TOLEDO, OHIO**

A 8658-½

PreCaster in operation at Reading Concrete Products Inc. Reading, Ohio

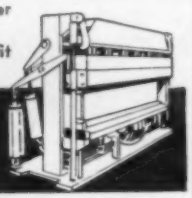
1000' of lintels daily

● Reading Concrete Products says that a few years ago they hesitated to take orders for precast items like lintels, fence posts, highway guard rail posts, etc., as their production by hand methods was very limited and their costs high.

● All this has been changed by their *PreCaster*. They now produce these items on a production basis with cost comparable to other concrete items they manufacture. They produce lintels on the *PreCaster* at a rate of 800 to 1000 feet per day . . . color and texture comparing favorably to their block.

● They write: "now you can realize why we consider our PreCaster purchase a very wise investment.

● Write today for PreCaster's new catalog detailing seven profit opportunities.



PRECASTER

5217 Beech Street • Cincinnati 17, Ohio

"Cleaned with a whisk broom, putty knife and . . .

EDI-COTE 103 in half the time!"

says owner* of this 17 year old mixer that looks like new.

EDI-COTE #103 is a revolutionary new release agent that prevents concrete from bonding to mixer blades and parts. EDI-COTE #103 eliminates the use of air guns and sledge hammers in the daily clean-up. EDI-COTE #103 creates a non-hardening film which prevents the forming of a bond between concrete and metal. It adheres rigidly and will not dissipate due to chemical action or abrasion. One application of EDI-COTE #103 will remain effective throughout the longest working day. EDI-COTE #103 can be applied with brush or spray. Shipped in 55 gallon drums. 5 gallon cans available for trial shipments only. Order EDI-COTE # 103 today!

* Frank Erdman & Son, Milwaukee, Wisconsin

Edick LABORATORIES

427 West National Avenue
MILWAUKEE 4, WISCONSIN

For further information on EDI-COTE #103, see your NCMA Technical Bulletin No. 2, Attachment No. 1, March 3, 1955.

New Literature

Transistorized portable two-way radiophones, delivering up to 20 times the frequency output of conventional equipment, are now available as a product of the *Motorola Communications and Electronic Division*. Special features include a snap-on power pack of dry or wet cells, or a 117 VAC power pack, which are interchangeable, with power ratings from 1 to 8 watts. **(113)**

A job-proved bonding agent which permanently bonds new concrete directly to old concrete is the most recent development of *Larsen Products Corporation*. **Weld-Crete** can also be adapted to use with gypsum board, all types of brick, masonite and many other surfaces. **(114)**

The Warehouser, a short, electrically powered standup lift truck, is now in production at the *Yale Materials Handling Division of the Yale and Towne Manufacturing Company*. The truck is designed to operate in aisles of less than eight ft., and in some designs, in aisles as narrow as six ft., with a capacity of 4,000 lb. **(115)**

Magic-Vulc No. 266, a Vinyl coating for protecting masonry, has been made available by the *Magic Chemical Company*. Magic-Vulc eliminates water seepage and painting while giving long-time protection against the elements. An outstanding feature is its use on masonry and on old paint. These coatings also waterproof and seal cinder, concrete, stucco and brick. **(116)**

Alox 46, manufactured by the *Alox Corporation*, is an additive for compounding highly effective concrete from oils which can be applied to molds by brushing or spraying. It is used to prevent the sticking of concrete to metal forms in the manufacture of concrete pipe and other precast objects. **(117)**

The *Oshkosh Motor Truck Company* now has in production a new four-wheel drive concrete carrier. The **50-50 Oshkosh Ready-Mix Concrete Carrier** is designed to carry 18,000 lb. on each axle and was designed specifically for the ready-mix industry. **(118)**

New tools designed for the purpose of impressing fresh, colored concrete, with various patterned surfaces are now being made by *Ornamented Concrete, Inc.* Constructed of cast-aluminum alloy, these tools permit on the job pattern making. **(119)**

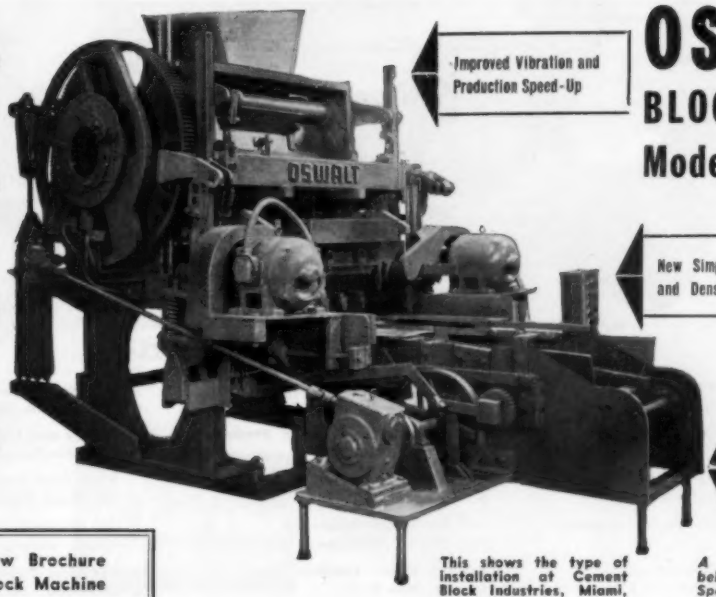
Compare these Advantages — Point by Point

Massive construction 2" stress relieved frame

Extra Strength and Stability

Smooth relaxed operation

All matching parts machined to precision fit



Improved Vibration and Production Speed-Up

New Simplified Height and Density Control

Shock-Free Ejector and Front End Pallet Feeder

OSWALT
BLOCK MACHINE
Model H, No. 55

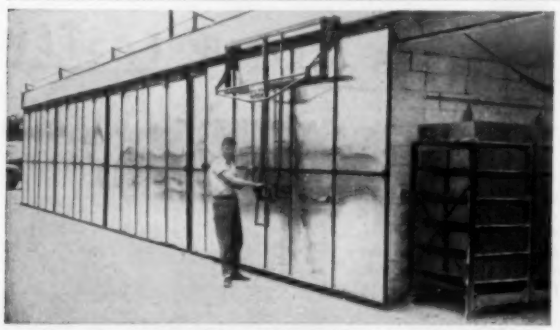
Write for new Brochure of Oswalt Block Machine

This shows the type of installation at Cement Block Industries, Miami, Fla.

A similar machine is now being erected at Broward Spetic Tank and Block Co., Fort Lauderdale, Florida.

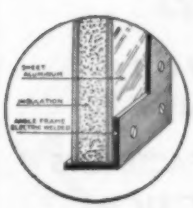
OSWALT ENGINEERING SERVICE CORP.

1335 Circle Avenue, Forest Park, Ill. • Phones: EStebrook 8-4664 (Chicago) — FOrest 6-2798 (Suburban)



Moore Carrier-type Doors at Albany (Ga.) Concrete Prod. Co.

Moore Metal-Insulated Kiln Doors Save Fuel—Reduce Curing Time



Keep heat where it belongs — inside the kiln — with Moore Aluminum-Insulated Doors. They improve curing conditions — save steam — last longer.

Send us dimensions of present door openings for quotation.

MOORE DRY KILN COMPANY

Oldest and Largest Manufacturers of Dry Kilns and Veneer Dryers

MORE WEAR PER PAIR

SURETY
TRIPL-PALM
COATED FABRIC GLOVES

2 way savings

TOUGHEST WHERE WEAR IS ROUGHEST
Tripl-Palm design eliminates the usual "failure points"—provides extra heavy palm coating for extra wear and comfort.

NO SEAM HERE
Nothing to rip out — wing thumb construction assures multiplied service life.

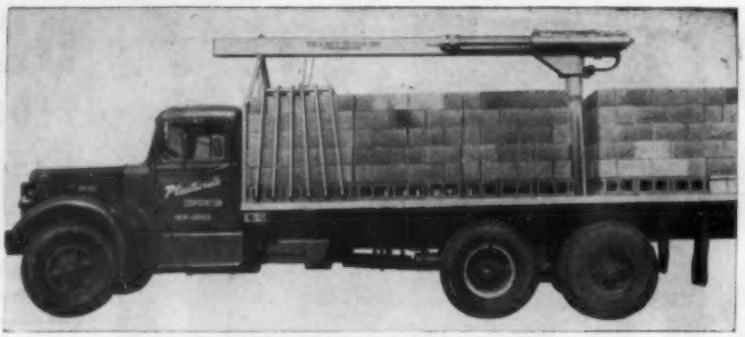
IDEAL FOR CONCRETE BLOCK HANDLING
Tests prove Tripl-Palm gives long service. Send for bulletin.

THE SURETY RUBBER CO. CARROLLTON, OHIO

In Canada: Safety Supply Co., Toronto

SIDE-O-MATIC

UNLOADS ON BOTH SIDES AND REAR



UNLOADS INTO BASEMENTS

PARTIAL LIST OF SATISFIED USERS:

Raymond W. Bartlett
West Creek, New Jersey

Allso Concrete Products Company Inc.,
Patchogue, Long Island, New York

City Cement Block Company,
Bridgeport, Connecticut (3 units)

Marquart Concrete Block Company,
Waterloo, Iowa

The Plasticrete Corporation
New Haven, Connecticut (2 units)

Daggett's Concrete Products
South Haven, Michigan

South Hammond Concrete Products Co.,
Hammond, Indiana

Maule Industries, Inc.,
Miami, Florida

Tait Block and Supply Co.
Port Huron, Michigan

Putnam Mason Supplies, Inc.
Carmel, New York

Concrete Masonry Corporation,
Elyria, Ohio (2 units)

Binkley and Ober, Inc.,
East Petersburg, Pennsylvania

Apex Coal and Supply Company,
Cleveland, Ohio

The Michigan Silo Company,
Peoria, Illinois (2 units)

The Ideal Builders Supply & Fuel Co.
Cleveland, Ohio (2 units)

SIDE-O-MATIC UNLOADER CORP.

P. O. Box 1561, York, Pa. • Phone York 7357

NOW MORE THAN **150** LICENSED MANUFACTURERS Producing

Patented
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Concrete STEPS

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The exclusive franchise for your territory may still be open.

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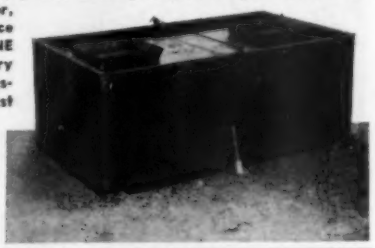
PROFITS CLIMB FASTER

when you use CARPENTER Septic Tank Forms and Handling Equipment. Boost production of premium units in wide demand — cut labor, operating and maintenance costs to the bone. ONE MAN handles our Delivery Rig. Our satisfied customers located from coast to coast.



Full Details on Request

CARPENTER MFG. CO.
Phone 2-0938
Harvie Road Carrier 94
Box 470, Richmond 23, Va.

Manufacturers of waterproofing compounds, curing compounds, air entraining agents, concrete plasticizer, masonry coatings and concrete hardener since 1926.

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SPRAY-O-BOND COMPANY

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For Fast Results . . .

ADVERTISE YOUR USED EQUIPMENT

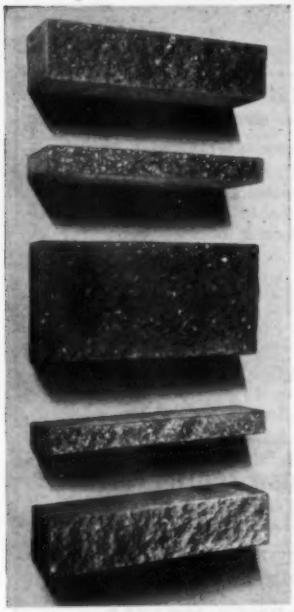
THE CONCRETE MANUFACTURER'S
CLASSIFIED SECTION

"The Marketplace of the Industry"

BES-STONE *Split Block* MAKES the Difference *

* Advances architectural design and beauty

* BOOSTS YOUR PROFITS!



Automatic operation — 960 Split Block per Hour

+ Add a BES-STONE BLOCK SPLITTER to your plant NOW

You'll find it full of profit-opportunity because the trend toward BES-STONE Split Block is strong! Architects, contractors, owners WANT this beautiful, modern, colorful "quarried stone" effect that is so ideal for all structures . . . commercial, institutional, residential. BES-STONE Block Splitter makes straight line cuts . . . no cull block. Automatic hydraulic operation . . . up to 960 Split Block per hour . . . safe, quiet . . . a big money maker!

Write for BES-STONE Bulletins 95A and 100

BES-STONE *the Split Block with Character*

BESSER COMPANY • Complete Equipment for Concrete Block Plants • Alpena, Michigan, U. S. A.

A 8008-1/4-H

DEPENDABLE FOR 50 YEARS

Woven Wire ALLOY SCREENS

TWIN CITY IRON & WIRE CO.
St. Paul, Minnesota

A "FIRST CLASS" DRAIN TILE MANUFACTURING BUSINESS

YOURS — FOR LESS THAN $500.00

Let Us Tell You HOW

Write for free Booklet on—
The MARVEL Drain Tile Machine
CONCRETE MACHINERY COMPANY, Inc.
HICKORY 1, NORTH CAROLINA

THERMO STONE BRICK EXPOSED MASONRY WALL UNITS

Dry, Frost-Proof Walls
No Furring Necessary

Two 1½" air spaces provide sufficient insulation.

PATENT PENDING

FRANCHISE MAY BE OPEN IN YOUR TERRITORY

Please address all inquiries to:

B. E. SCOTT, THERMO STONE BRICK, 1605 PIONEER BLDG., ST. PAUL 1, MINN

Concrete Manufacturer Classified Section

431 S. DEARBORN ST., CHICAGO 5, ILL.

Advertising Rate Per Issue: $11.00 a Column Inch. Lower Rates on a Contract Basis — Write for Rate Card.

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TRANSIT-MIX & PRODUCTS

CENTRAL FLORIDA firm has opening for man with not less than 10 years experience in plant supervision. Replies confidential. Submit complete qualifications and details.

Box CM-3052 c/o THE CONCRETE MANUFACTURER
431 S. Dearborn St. Chicago 5, Ill.

WILL BUY

Going concrete pipe business. Will consider either single or multiple plant operation. All replies in strict confidence.

Box CM-3042, c/o THE CONCRETE MANUFACTURER
431 S. Dearborn St. Chicago 5, Ill.

PRICED FOR QUICK SALE

As we have purchased larger Stearns equipment, we have the following good used equipment for immediate sale:

1—COLUMBIA, Model 8, automatic, two block machine
1,500—¼" x 18" x 18" plain steel pallets
1—18 cu. ft. BESSER mixer
1—18 cu. ft. BESSER skip loader
1—8" x 8" x 16", 2-CORE TYPE MOLD, complete
1—8" x 6" x 16", 2-CORE TYPE MOLD, complete
1—8" x 4" x 16", 2-CORE TYPE MOLD, complete
1—8" x 8" x 8", MOLD, complete
1—Pallet cleaner and oiler.

This equipment is in good condition and can be seen in operation.

PARRISH FRUIT COMPANY
407 North Spring Garden
De Land, Florida

FOR SALE

Lot of 3, 5, 7½, 10, 15 & 25 HP G.E. Motors all 3/60/440 v. open, sleeve bearings. Speeds 720 to 1200, all type KT. Perfect condition, reasonable.

G. A. UNVERZAGT & SONS INC.
136 Colt St. Irvington 11, N. J.

Pumice Block Plant, established 14 years, good gross with high net, only one in trade area of 50,000. Located in one of the best booming towns in entire state of Wyoming. Definitely priced to sell. Information and free photos mailed, no obligation whatsoever on your part. **C-5350 Continental, 804 Grand, Kansas City, Mo.**

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All shades and grades the highest quality. *Write for color cards, prices and samples*

RICKETSON MINERAL COLOR WKS.
MILWAUKEE 2, WISCONSIN
Established 1885

LOWER COST

packer-head wings

Proved to last as long or longer — yet cost considerably less. Write for prices.

TEXAS FOUNDRIES
LUFKIN, TEXAS

MINERAL COLORS

for

BRICK MORTAR
STUCCO-PLASTER-CONCRETE

"Fine Because of Their Fineness"
Ask for samples and recommendations.
BLUE RIDGE TALC CO., INC.
HENRY, VIRGINIA

FOR SALE

2 Block Lith-I-Bar Machine 1951 Model in good running condition with off-bearer. Practically rebuilt. With spare parts. $4,200.00

4", 6", 8", 12" and 2 types chimney block and brick attachments. New 8" and 12" cores never been used. Brick and 6" attachments used very little. $2,500.00

2,000 18x18 pallets @ $1.30

15 H.P. Scott Air Compressor $950.00

Reason for selling, purchased three (3) block machine.

CALN BLOCK COMPANY
COATESVILLE, PA.

Superintendent Wanted By Concrete Products Plant In New York Area.

Box CM-3082 c/o THE CONCRETE MANUFACTURER
431 S. Dearborn St. Chicago 5, Ill.

FOR SALE

Go Corp J. Twin Concrete Block Machine—practically new—has made less than 400,000 blocks—also 13,885 pallets and 60 racks—$10,000.00

UNION MINING CO.
Oliver Bldg. - Pittsburgh 22, Pa.

FOR SALE

Concrete Plants — Ready-Mix — Two — Missouri towns, owners retiring, large volume, wonderful potential.

McHUGH, INC.
LONG BLDG.
10th & Grand, Kansas City, Mo.

FOR SALE

1951 Model Kent Continuous Mixer with all motors — good mechanical condition $2,000.00

Dry Creek Crushed Gravel Co.
Phone FA 6-4481 R. D. #3
Newark, Ohio

Concrete Pipe Forms & Vibrators

GEORGE W. HOFFMANN CO
P. O. BOX 462, SIOUX CITY, IOWA, U.S.A.
and
THE VIBRAPIPE EXPORT CO.
50 BROAD ST. - SUITE 1224
NEW YORK 4, N.Y., U.S.A.

unbreakable

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Write for full information

TEXAS FOUNDRIES
LUFKIN, TEXAS

FOR SALE

2—No. 9 Joltcretes
4—Turntables.
2—Air Hoists with Booms.
65—Block Racks (72 Blks) 6", 8", 10" & 12" Mold Boxes-Attachments and Pallets included.

Send for itemized list-Must be sold in one package.

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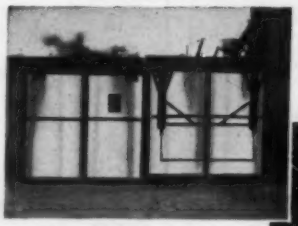

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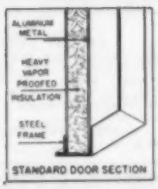

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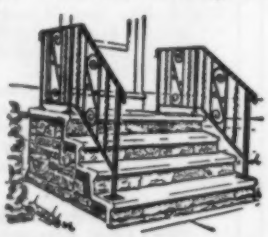

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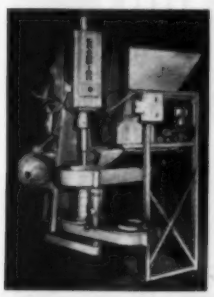

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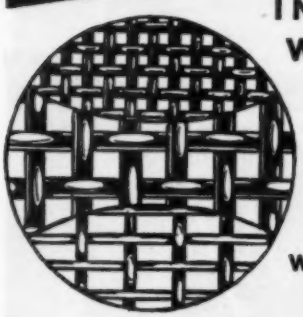

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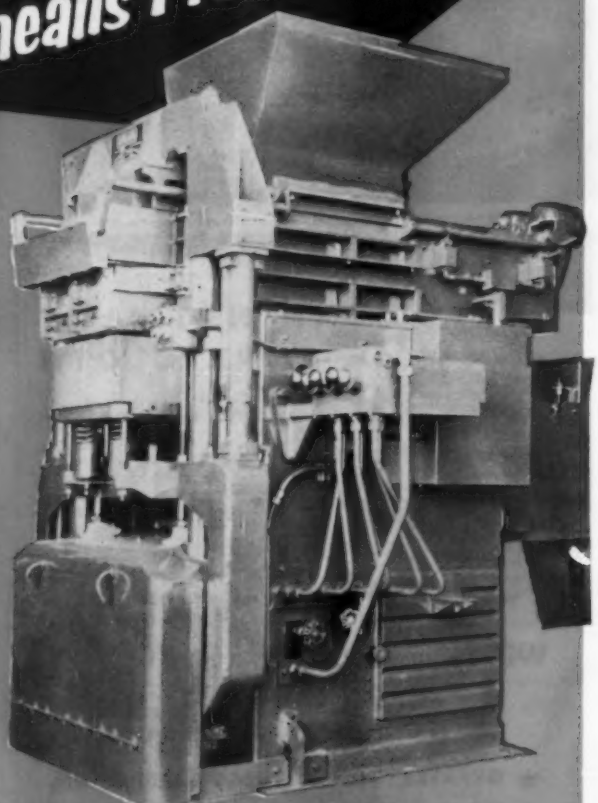

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Home Office: 107 S. GRAND, VANCOUVER, WASHINGTON

Factory Branch and Warehouse: Mattoon, Illinois

American-Marietta Reveals Plan For $15,000,000 Major Expansion

American Marietta Company officials have announced a $15,000,000 expansion program, the most extensive in the firm's history, which is to effect a sharp increase in concrete pipe, portland cement, and lime output. It was indicated that facilities of several plants of the Standard Lime and Cement Company, a subsidiary, will be expanded for increased lime, dolomite, and magnesite production.

At Roberta, Ala., a new unit will increase the cement capacity of the Southern Cement Company Division by 60 percent. This addition is scheduled to be completed early in 1957. Lime facilities at Roberta will also be expanded.

Other American-Marietta concrete products plants will be enlarged to raise the output of culvert and drainage pipe for highway construction.

At the stockholder's annual meeting Robert E. Pflaumer, president, announced that profits for the first quarter (ending February 29) would be at least 50 percent greater than for the comparable period in 1955. Stockholders approved increases in the authorized preferred stock from 200,000 to 300,000 shares, common from 6,000,000 to 10,000,000 shares, and Class B common from 1,400,000 to 2,800,000 shares. These increases will finance future expansion and diversification.

New Packaged Concrete Mix Product Marketed by Handicrete Under License

A new packaged product for making concrete has entered the competitive market for general consumption. Handi-Crete is the registered trademark and name for a system under which dehydrated and proportioned concrete mix, sand mix, and mortar mix are nationally manufactured and sold.

As a licensor, the Handi-Crete organization, of 3105 Roswell Road N.E., Atlanta, Ga., also grants exclusive rights to manufacture and sell these products for a one-time fee based on the population of the area served. Reported to be a simple addition to existing plants using the same basic ingredients, it is also said that the process may be housed in facilities which would cost approximately $30,000 for construction.

Abridged Concrete Manual Offered in New English Edition

Field Testing of Concrete, an abridged version of the Norwegian original work by Sven Thaulow, chief construction engineer, A/S Christiania Portland Cementfabrik, is still available.

This booklet, containing simplified methods for testing concrete and its aggregates, was published in 1952, as translated and edited by Professor Alexander T. Andreassen, Pennsylvania State College. The original work was published more than a decade before this.

Fully illustrated with photographs, graphs, and sketches, the booklet covers the following main topics: testing equipment, experimental development, testing of aggregates and cement, testing of fresh concrete, testing of hardened concrete, and time required to perform tests.

Published by Norsk Cementforening, Olso, Norway. Price, $1 per copy.

The annual spring meeting of the Concrete Products Association of Washington will be held in Seattle on March 15, 16, and 17. The first day will be devoted to general business and the block industry. Addresses and business matters will be scheduled for the second day, and pipe manufacturers will convene on the third day.

Widen your sales horizons with Split Block!

A Columbia fully-automatic block splitter, representing a relatively small increase in your total plant investment, will vastly expand the number and types of units you can offer your customers. Split block, with its tremendous variety of textures, colors, sizes and shapes, also opens new avenues for sales in residential and commercial construction.

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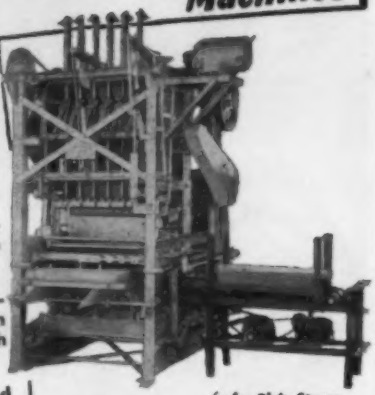
OK Automatic SILO STAVE Machines



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- One-Man, Push-Button Operation (when used with OK Air Hoist).
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- 4-5 Staves per minute, up to 1500 per 8-hr. shift.

New ONE MACHINE
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This New OK Automatic Machine will multiply the money-making potential in your territory. Sell more Silo Staves—use high production OK Equipment.

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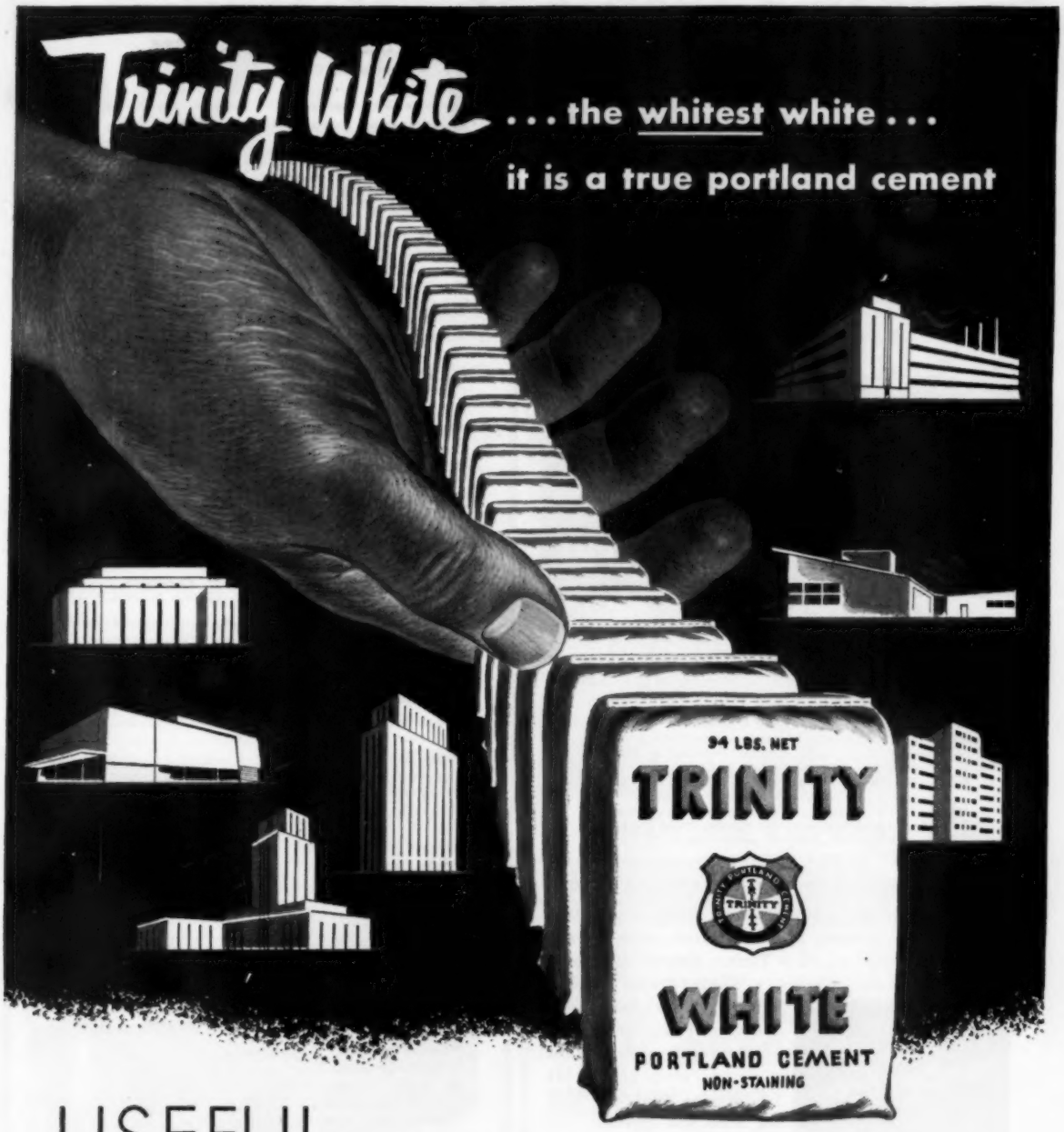

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For paved yards or indoor work, ask about the new two ton Model W-40.

WRITE TODAY FOR FURTHER INFORMATION ON EITHER OR BOTH OF THESE NEW TRUCKS. EVEN WITH THESE EXTRA FEATURES TRUCK-MAN COSTS LESS.

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faster-more efficiently

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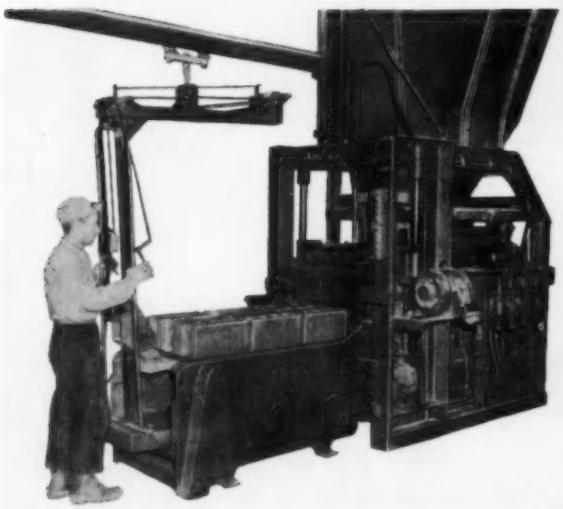

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KENTWIN ------- 2 per cycle

2 — 8" Blocks Per Cycle —
max. 5/16" x 18-1/2" x 18-1/2" Pallet

• • •

2 — 10" Blocks Per Cycle —
max. 5/16" x 18-1/2" x 22" Pallet

Front Pallet Return Recommended. Available On All Plain Pallet Machines.

KENT SUPER BLOCKMAKER 1 per cycle

Cored Pallet — semi-automatic.

See KENT MACHINERY IN OPERATION RIGHT IN YOUR OWN OFFICE

Just ask to have our Representative Bring the Movie Projector

Send Information Regarding KENT MACHINE CHECKED

☐ THE KENTHREE ☐ THE KENTWIN
☐ THE KENT SUPER BLOCKMAKER.

Name_____

Address_____

City_____ State_____

The KENT MACHINE CO.

DIVISION OF THE LAMSON & SESSIONS CO.

CUYAHOGA FALLS, OHIO

Manufacturers of

CONCRETE PRODUCTS MACHINERY SINCE 1925

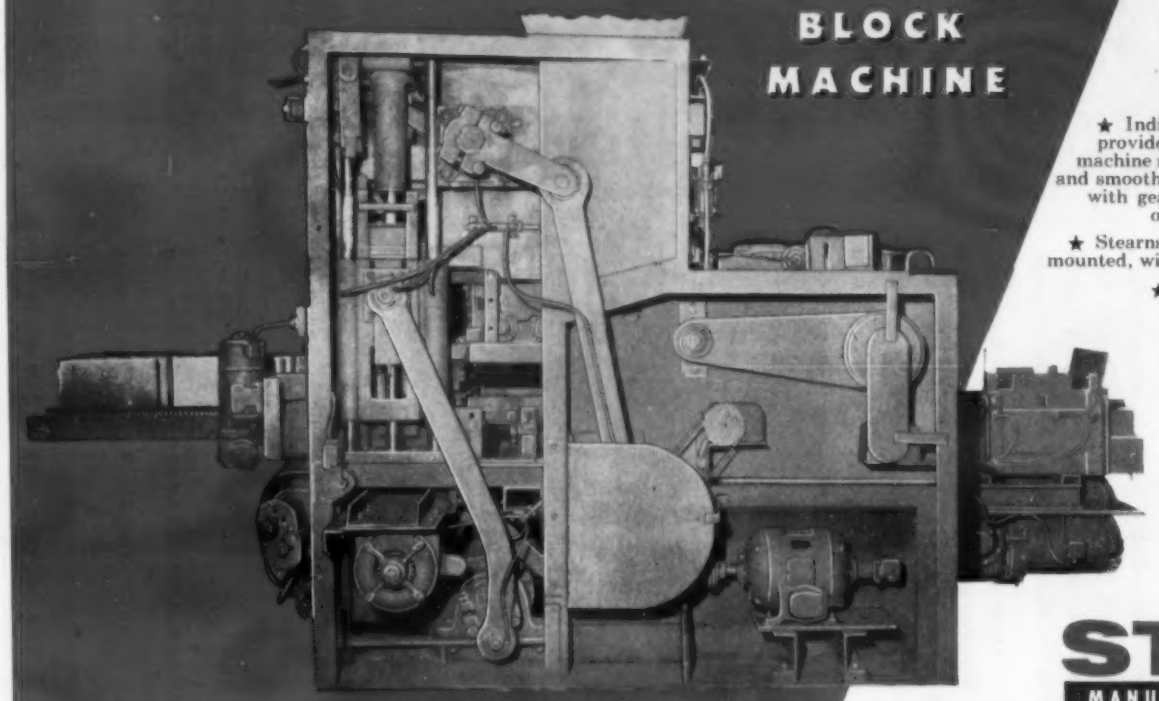
THE WETTLAUFER EQUIPMENT, LTD. 49 MERTON STREET • TORONTO, ONTARIO, CANADA

STEARNS *alone!*

has the ALL NEW, REVOLUTIONARY,

ELECTRO MATIC

BLOCK MACHINE



Another of the many Stearns FIRSTS in basic design, to set the Trend for the Industry.

The newest concept of power application, in block machines.

• No CAMS! • No OPEN GEARS or PINIONS!
• SPEEDS PRODUCTION!
• SLASHES MAINTENANCE COSTS!

★ Individual, motor driven, enclosed gear units, provide crank controlled harmonic motion to all functional machine movements, for rapid acceleration and deceleration, and smooth sequence operation. Gear units are interchangeable, with gear running in sealed oil bath for trouble-free operation and service.

★ Stearns unidirectional dual shaft vibration, stationary mounted, with TWIN 7½ HP 3500 RPM motors.

★ Same type unidirectional vibration, regardless of mold used.

★ UNIFORM COMPACTION IN ALL COMPARTMENTS!

★ Vertical strip packer head, with frame cast integral with vertical guides.

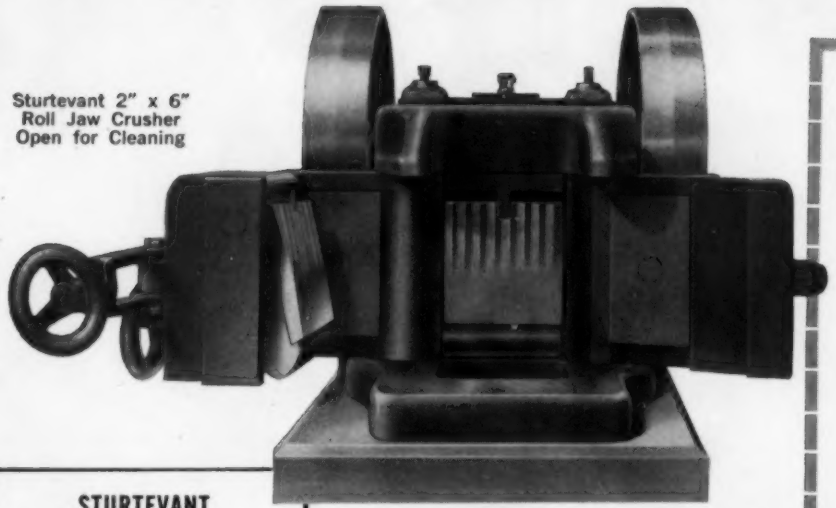
★ The ELECTROMATIC can be converted to 12 inch, 8 inch, or 4 inch high units in approximately 60 minutes. Added protection on your investment, for the growing specialty market.

★ Three 8 x 8 x 16 or 8 x 8 x 18, or equivalent units per cycle, on 18½ x 26 inch plain steel pallets.

STEARNS
MANUFACTURING COMPANY · INC.
ADRIAN • MICHIGAN

COMPLETE CONCRETE PRODUCTS PLANT EQUIPMENT

"OPEN-DOOR" DESIGN CUTS SAMPLING TIME



Sturtevant 2" x 6" Roll Jaw Crusher Open for Cleaning

STURTEVANT LABORATORY EQUIPMENT

ROLL JAW CRUSHER

First choice for hard rocks. Jaw opening — 2 x 6 in. Approx. capacity: ⅛ in. setting — 700 to 800 lbs. per hr.; ¼ in. setting — 1000 to 1200 lbs. per hr.

CRUSHING ROLLS

Two sizes: 8 x 5 and 12 x 12. Outputs range from ¾ in. to 20 mesh at capacities from ¼ to 10 tons per hr. Performance varies with materials.

SWING-SLEDGE MILLS

For pulverizing soft, hard, tough or fibrous materials ranging from 1 in. to 20 mesh. Feed opening — 5 x 6 in. Capacities at 250 lbs. to 1 ton per hr. for 10 mesh, depending on materials.

SAMPLE GRINDER

Produces samples between 10 and 100 mesh with simple handwheel adjustments. Capacity up to 200 lbs. per hr. with ¼ in. or finer feed.

Small-Scale Duplication of Full-Scale Production

All Sturtevant Laboratory Equipment is ruggedly constructed. So much so that it is used in regular plants for round-the-clock operations. Exclusive "Open-Door" design makes cleaning and maintenance between sample runs quick and easy.

Preferred by laboratories that are proud of their work. Users of Sturtevant Laboratory Equipment represent the "blue chips" in industry and education. Names on request. Check the coupon for full information.

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Dry Processing Equipment

The "OPEN DOOR" to *lower* operating costs over *more* years

CRUSHERS • GRINDERS • MICRON-GRINDERS • SEPARATORS
BLENDERS • GRANULATORS • CONVEYORS • ELEVATORS

STURTEVANT MILL COMPANY, 104 Clayton Street, Boston 22, Mass.

Please send me your bulletin on Laboratory Equipment ☐

Also bulletins on machines for:

☐ CRUSHING ☐ GRINDING ☐ PULVERIZING
☐ MICRON-GRINDING ☐ SEPARATING ☐ BLENDING
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My dry-process materials are:_____

Desired capacity is:_____

Name_____

Firm_____ Title_____

Street_____

City_____ Zone_____ State_____

TORRINGTON *SPHERICAL ROLLER* BEARINGS

This bearing can take thrust, too!

Design is the secret. TORRINGTON Spherical Roller Bearings are made with an integral center flange on the inner race. This assures *positive radial stability and accurate positioning of rollers* wherever high radial load and heavy thrust are encountered under conditions of misalignment.

From crushers to cranes, power shovels to pulverizers, you get long, maintenance-free operation, better performance in your equipment, more value from your bearing dollar when you specify these rugged dependable bearings.

Prove to yourself that TORRINGTON design does make a difference. Next time specify TORRINGTON Spherical Roller Bearings. They're available with either straight or tapered bore, for shaft or adapter mounting.

THE TORRINGTON COMPANY

South Bend 21, Ind. • Torrington, Conn.

District offices and distributors in principal cities of United States and Canada

90th ANNIVERSARY 1865–1955

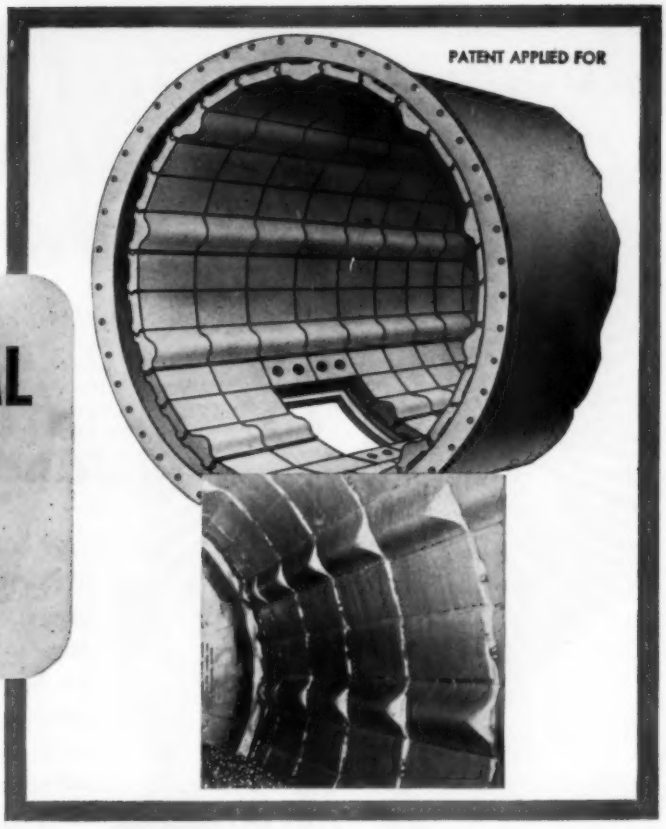
TORRINGTON BEARINGS

Spherical Roller • Tapered Roller • Cylindrical Roller Needle • Ball • Needle Rollers

New

B&W UNIVERSAL LINER PLATES

Raise Performance, Lower Costs



The new B&W Tube Mill Liners have advantages that mean reduced costs in capital, time and labor.

Cost per ton of material ground is reduced, for the practical reasons listed below. Check them—you may find that one, or a combination, of these qualities will solve your existing problems.

- Lower Initial Costs—No pattern and chiller costs —the result of standardization.
- Longer life of liners—Uniform wear will result from better quality control on a mass production casting, utilizing permanent molds. Size is ideal for uniform chill and heat-treatment.
- Longer life for different applications can be realized by a selection of proper materials. This design lends itself to either chilled irons or wear steels.
- Direct labor cost and the "down-time" to install the liners are reduced. Castings are easily handled due to small size and weight. Less fatigue of workers. No cranes needed to handle lightweight liner castings.
- Cost reduced for storage space. Minimum storage space required as small castings "stack" easily. Records simplified with one design of casting interchangeable for all size mills.
- Saves money on liner inventory. One design fits all sizes of mills, permitting standardization. Quicker unloading and storage possible.
- Savings in breakage claims and delays for replacements. Hard brittle irons are frequently broken in shipment when large castings are used. Small castings are rugged and almost impossible to break by handling.
- Savings in determining most efficient wear pattern. Same castings will produce wear profiles consisting of all lifter ribs, all flats or combination of both, including straight or spiralled lifter ribs. Straight or staggered circumferential joints can be used.

Liners are supplied in two nominal thicknesses, $1\frac{1}{2}''$ and $3''$ with $1\frac{1}{2}''$ high lifters. Castings are $6''$ wide x $12''$ long. Positive seating of small castings on mill shell means less breakage of castings under operating conditions. For additional information on B&W Universal Tube Mill Liner Plates, write The Babcock & Wilcox Company, Process Equipment Dept., Barberton, Ohio.

BABCOCK & WILCOX

BOILER DIVISION

S-448

The most important date for the Construction Industry in 1957

A.R.B.A.
ROAD SHOW and CONVENTION
PLAN NOW!

1957 will bring with it the first Road Show in almost 10 years! Tremendous advancements have been made in this last decade. New equipment has been developed. New methods have superseded old. New cost-cutting ideas have come forward. Here is the time and place to bring yourself up to date on all the new developments.

Nothing is being spared to make this 1957 Road Show the greatest indoor exhibit of machinery and materials ever gathered together. At the same time, the A.R.B.A. convention will give you an opportunity to learn about new methods and practices and hear outstanding authorities discuss the solution of problems that are bothering you.

Put it down as the most important date for the construction industry in 1957. Write for data on reservations. Ask to be put on the list to receive future information on the 1957 A.R.B.A. Road Show and Convention.

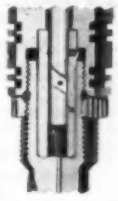
AMERICAN ROAD BUILDERS' ASSOCIATION
World Center Building
Washington 6, D.C.

This is the *COMPLETE* fuel injection system of a *MURPHY DIESEL*.....

Here is the simplest, most effective diesel fuel system ever developed—the Murphy Diesel Unit Fuel Injection System. A low pressure fuel supply pump serving a unit fuel injector for each cylinder is all there is to it. There is no master high pressure pump. There are no high pressure fuel lines. On the rare occasions when service is necessary, just put in the spare injector and have the removed injector serviced at your convenience. But most important of all, the Murphy Unit Injector in combination with "true" diesel operation enables you to get more work out of every gallon of fuel . . . better performance at lower cost.

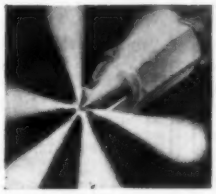
SIMPLE . . . DEPENDABLE . . . ECONOMICAL

Injector drive is direct from the overhead camshaft by means of a rocker arm. Precision rack and pinion actuated by hydraulic servo type governor controls the amount of fuel to be injected.



Fuel enters the injector at approximately 20 psi, travels through an annular passage into the injector cylinder. No priming —no bleeding.

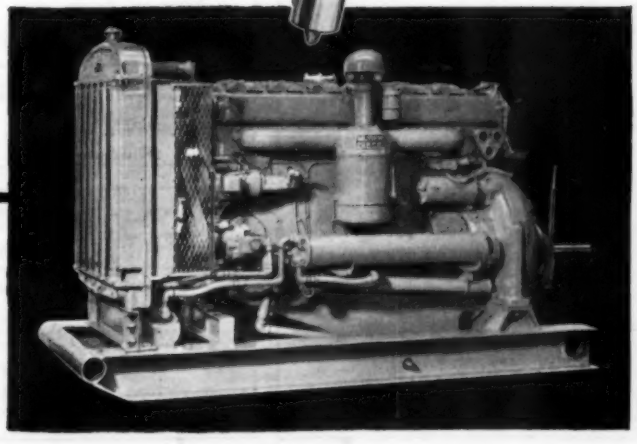
On the plunger's downstroke, the intake port is closed and the fuel forced out the nozzle through **dual** flat seat check valves — **double** protection.



Solid fuel forced through six properly sized holes in the nozzle is completely atomized as a fine fog and distributed through the incandescent air charge to provide thorough combustion.

HERE'S HOW YOU BENEFIT

- Eliminates long high-pressure fuel lines
- Eliminates pre-combustion chambers, energy cells or hot spots
- Prevents erratic, irregular injection
- Eliminates priming or bleeding
- Stops after-dribble or leakage
- Eliminates elaborate injector adjusting equipment
- Eliminates maintenance of separate components
- Easier starting
- Greater economy
- Smoother operation
- More power
- Less fuel consumption
- Lower maintenance
- Less down time



MURPHY DIESEL

341

MURPHY DIESEL COMPANY

5307 W. Burnham St. Milwaukee 14, Wisconsin

Heavy duty engines and power units, 96 to 264 H.P., generator sets 64 to 165 K.W.

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QUARRY ENGINEERS

Leading producer of sand and gravel in Chicago area needs experienced men to assist superintendents of large volume quarry operation, leading to top responsibility in near future. Some engineering or equivalent, and actual responsibility for production and supervision preferred. Opportunity for promotion, good salary, retirement income, insurance plans, and bright future. Reply, giving personal and work history and salary requirements.

BOX PQ-3015, c/o PIT AND QUARRY PUBLICATIONS
431 S. Dearborn St. Chicago 5, Ill.

SALES ENGINEERS

Explosives manufacturer with nationwide distribution has attractive openings for men with technical background or practical experience as sales engineers; age, under 30 preferred. Starting salary commensurate with experience. Considerable traveling is required. Liberal benefits. Every incentive for advancement.

This is an excellent opportunity for the application of your knowledge of mining, quarrying, construction, and related industries.

Send complete resume. Photograph, optional. All correspondence will be held in strict confidence, and references will not be contacted without permission of applicant.

Box PQ-3013, c/o PIT AND QUARRY PUBLICATIONS
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WANTED

MAINTENANCE SUPERINTENDENT

Must be familiar with diesel engines, shovels, tractors, crushing and screening equipment, etc. To head maintenance program of Stone Quarrying and Crushing operation. Location: Mid-East. Salary plus Bonus. Please state salary required, experience, when available. First reply.

Box PQ-112 c/o PIT AND QUARRY PUBLICATIONS
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WANTED

Manager for Western gravel and concrete producer. Will pay $10,000 per year for qualified man, with ample chance for increase if you can earn it. Reply to

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ANYWHERE
We look into the earth
PENNSYLVANIA
DRILLING COMPANY
PITTSBURGH 20, PA.

WANTED

Superintendent for a small quarry and crushing operation who is familiar with power shovel, drilling, and quarrying equipment. Must be capable of taking charge of stone quarrying and crushing operations. Should have some engineering and general supervision ability. Location: in south eastern state. Please advise experience and salary expected.

BOX PQ-202, c/o PIT AND QUARRY PUBLICATIONS

431 S. Dearborn St. Chicago 5, Ill.

PROJECT ENGINEER WANTED

Graduate Mining, Metallurgical, Chemical or Mechanical Engineer, preferably 25 to 35 years old, wanted by medium size progressive heavy machinery manufacturing company located in Southeastern Pennsylvania. To assist in design and preparing for market of various lines of equipment used in mineral dressing, heavy chemical, cement and rock products industries. Must have had engineering and field experience, and be willing to work on drafting board, travel and do field service. Opportunity also exists for a properly qualified individual, eventually to become a sales engineer. Salary open.

BOX PQ-904, c/o PIT AND QUARRY PUBLICATIONS

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FOR SALE
1005 KOEHRING DRAGLINE

Machine in excellent shape.
Located in Montana.

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1—Link Belt dble. deck concentric action vibrating screen size CA2410, used 3 weeks, price $1300.00

1—Gallon Tandem Roller 8-12 ton hyd. steering, water att., price $3200.00

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519 N. Delaware Ave. Philadelphia 23, Pa.

HAISS MODEL 80W BUCKET LOADER

5 Cubic yard per minute loading capacity
4-Wheel Drive
Hydraulic boom control
Fully Reconditioned
Price Reduced for Quick SALE!

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EUCLID REAR DUMP TRUCKS

Model 9W BUCYRUS-ERIE Dragline, 8 yd.
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Model 120B BUCYRUS-ERIE Shovel & Drag, 5 yd.
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Model 4500 MANITOWOC Dragline, 5 yd. & 5 yd. shovel.
Model 4181 MARION Shovel & drag, 5 yd.
Model 7400 MARION dragline, 9 yd.
Model 80-D NORTHWEST shovel, 2½ yd.
Model 6 NORTHWEST shovel, 1½ yd.
Model 1201 LIMA dragline, 3½ yd.
Model 3500 MANITOWOC dragline, 2½ yd.
5 yd. Dragline, excellent condition, $35,000.00.
CATERPILLAR GRADERS
ROGERS Lowbed trailer.

WILLIAM LUBRECHT, III
Construction Equipment

311 W. Diamond Ave. Hazleton, Pa.
Phone: GLadstone 5-4041 or 5-0253

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1—Rake Classifier—14'x30' Dorr Type QSFX Special

2—Rake Classifier—12'x31'6" Dorr Type QSFXM.

3—Bowl Classifier—16'x42'x28' Dorr Type QSFXB.

1—Bowl Classifier—16'x42'x28' Dorr Type QSFX. Dismantled—No drive equipment.

3—Filters—12'6"x12 Disc United Oliver Filter Type 6F4. With necessary AC motors and speed reducers. Fair condition.

PERMANENTE CEMENT COMPANY
PERMANENTE, CALIFORNIA
Telephone—Axminster 6-6420

FOR SALE

Two practically new electrically heated 4' x 10' Hum-mer vibrating screens now operating in Youngstown, Ohio. 25 KW Buda diesel generator set, 220/3/60, 1200 RPM, excellent condition, located at Chicago.

MID-CONTINENT COAL AND COKE CO.

Mr. Davis, 105 West Adams Street
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FOR SALE

1—40-42 Farrell Jaw Crusher
1—30-42 Buchanan Jaw Crusher
24-36 Telsmith Ball Bearing Jaw Crusher with 36" x 12' Heavy Duty Feeder
1—18-32 Telsmith Jaw Crusher
1—18-30 Telsmith Jaw Crusher
14-26 Acme Jaw Crusher
10-20 Jaw Crusher, Blake Type
2—32" Telsmith Gyratory Crushers
1—18" Intercone Crusher
1—24" Cone Crusher
1—20 x 24 New Holland Roll Crusher
1—16 x 16 New Holland Roll Crusher
1—3' Symons Cone Crusher
1—3-10 D.D. Telsmith Screen
1—10-40 Good Roads Jaw Crusher
1—10-30 Good Roads Jaw Crusher

BLUE BALL MACHINE WORKS, Blue Ball, Pa.

FOR SALE

1—Deister 3' x 8' 4 deck vibrating screen complete. Ready to work motor, drive discharge chutes, screen cloth and extra parts. Excellent condition. $2,000 f.o.b.

1—Allis Chalmers 7½K Gyratory Crusher with numerous spare parts. Good condition. Price, $3,500 f.o.b.

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BALL MILLS—8x7, 5x10, 6x7, 6x8, 6x9, 8x10, 9x13, 7x7, 7x8, 7x8, 8x8, 8x14 & 5'x18'. Also 5'x8', HARDINGE—16"x48", 8"x48", 8"x22", 8"x18", 6" x36"
ROD MILLS—8x10, 4x7, 4x14, 5x10, 8x14, 6x13 & 8'x18'. Also 5'x18'.
2—Denver 36"x54".
TUBE MILLS—3'x13', 5'6"x23', 5'x18' & 9'x22'

HAMMERMILLS

13—Jeffrey 32x24, 30x36, 30x36, 36x48, 42x36 & 42x48.
WILLIAMS GA30—24x30 & GA60—24x60.
DIXIE 5040—MOGUL 50x40 & 30x30.
GRUENDLER 5XD—48x30 & 1—5XA—30"x30".
2—PENNA. 8XB—100 TPH.
UNIVERSAL No. 4—36x26.
PENNA. THOR 8XT 18-48. Size 48x54.

APRON FEEDER

3—3'x9', 3'x12' & 54"x10'3".

AIR SEPARATORS

5 Sturtevant 10', 14' & 16'.
4 Gayco 5', 6' & 5'.
1—12 D Raymond Clone.

FILTERS, SEPARATORS—CLASSIFIERS

11'6"x18', 14'x18' & 8'x10' Oliver Drum Filters.
8'x30' Dorr DSD Duplex Classifier.
6'x14' HARDINGE COUNTER CURRENT.
DINGS MAGNETIC TYPE IB 2 STAGE 60".
THICKENER. ALSO 3 DORR & 25'x10'.
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17—Thickeners Dia. 100', 80', 90', 24', 10', 12'.
3—Hydro Separators 60"x15' & 20'x2'.
3—Wemco 10'x50' Sand Launders.

ROTARY DRYERS & KILNS

ROTARY KILNS: 4'x28', 8'x28', 6'x8'x80', 8'x125', 2—6'x80', 6'x30', 8'x2', 6'x7'x30' 8'x125', 2—7'x110'.
ROTARY DRYERS: 3'x26', 4'x20', 4'x40', 5'x33' 6'x40', 6'x30', 11'x75', 4'x20', & 90"x80'.

JAW CRUSHERS

BLAKE TYPE—42x24, 40x48, 42x48, 48x60, 24x36, 18x36, 15x30, 13x30, 12x34, 12x16, 10x20, 30x42.
SINGLE SHAFT—18x36, 15x36, 15x30, 10x40, 10x30, 10x20.
CAM & ROLLER—24x40, 14x26, 11x26, 10x30, 6x20.

GYRATORY FINE REDUCTION CRUSHERS

NEWHOUSE 7", 10", 14"—KENNEDY 19S, 28S, 8T—SUP. MoC. 6" & 10" AL. CHAL. 22IR, TRAYLOR TY 36".

GYRATORY STD. PRIMARY CRUSHERS

6", 10", 14", 16", 20" & 36" SUP. McC.—GATES AL. CHAL. 3, 4, 5, 6, 7½, 9, 9, 12K.
PARTS FOR 42" SUPERIOR McCULLY.

57 VIBRATING SCREENS

NIAGARA AC—ROBINS—LINK BELT—3x5, 3x8, 3x8, 3x10, 4x5, 4x8, 4x10, 4x14, 4x16, 5x8, 8x10 & 8x14, 1-2-3 & 4 Decks.

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2—16 Ton & 10 Ton Plymouth Diesels.
1—45 Ton & 5—45 Ton G.E. Diesel Elec.
10 TON DAVENPORT & 25 Ton Plymouth Gas.
2—14 Ton Brookville Diesels. Also 10 Ton Diesel.
8—PLYMOUTH GAS. 6 - 8 - 10 TON.
23—BATTERY & TROLLEY, 4, 6, 8, 10 TON.

LOCOMOTIVE CRANES

30 TON OHIO STEAM, 50 FT. BOOM.
25 TON AMER.—30 TON OHIO DIESELS.

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7—48 In., 30 In., 24 In., 18 In.

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GUY: 8 TON 85 FT. BOOM, 25 TON 60 FT. BOOM, 15 TON 100 FT. BOOM, 30 TON 115 FT. BOOM, 50 TON 100 FT. BOOM.
STIFF LEG: 5 TON 70 FT. BOOM, 15 TON, 100 FT. BOOM, 25 TON 100 FT. BOOM, 75 TON 135 FT. BOOM. 1—5 TON 100 FT. BOOM.

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15—8,000, 10,000 & 20,000 GAL. CAP. WITH COILS. 6—10,000 GAL. R.R. CAR TANKS.

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177—DUMP STD. GA.—30, 16, 12, 6 & 4 YD.
36—FLATS—10 TON, 40 TON, 50 TON CAP.
44—TANK CARS—8,000 & 10,000 GAL. CAP.
75—V Dump Cars, 1½ & 3 Yd.

R. R. CAR DUMPER

150 TON CAP. STD. GA. CAR DUMPER.

AIR COMPRESSORS—ELECTRIC

198, 420 & 676 WORTHINGTON BELTED.
1302 CFM & 1574 CFM INGER. RAND PRE-2.
1170 CFM GARDNER DENVER HAE1084-2300 V.
1575 & 2200 CFM—OCE—CHGO, PNEU. ELEC.
3078, 3864 & 5040 CFM Inger. Rand.

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CLYDE HYDRATOR WITH KUNTZ CONTINUOUS DUSTLESS SYSTEM. 4-5 T.P.H.

42" CONVEYOR EQUIPMENT

42"x85' Stacker Conveyor.
6—Conveyors, 42", 500' to 900'.

R. C. STANHOPE, INC.
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MOTORS AND GENERATORS

All sizes, new and rebuilt. Starters, accessories, pulleys and repair parts. Gear motors, Falk Shaft mounted Speed Reducers, couplings and V-belt drives.

EXPERT REPAIR SERVICE

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KILNS—DRYERS—COOLERS

1—8′ x 125′, ¾″ shell.
4—7′ x 110′, 9/16″ shell.
1—7′6″ x 7′ x 125′, ½″ shell.
3—6′ x 74′, ⅝″ shell.
1—8′ x 67′, 5/16″ shell.
1—8′ x 40′, ⅝″ shell.
1—6′ x 60′, 5/16″ shell.
1—4′6″ x 50′, ⅜″ shell.

CRUSHERS—PULVERIZERS—MILLS

2—Allis Chalmers 10″ Superior McCully.
1—Allis Chalmers k-9 Gates Gyratory.
10—Jaw Crushers, 5″ x 6″ to 42″ x 48″.
2—Pennsylvania #SXR-100, 100 TPH.
3—Hardinge 4½′ x 16″, 6′ x 22″, 7′ x 36″ Ball Mills.
3—Patterson 6′ x 8′ Ball Mills.
1—Raymond #40 Imp.
1—Williams #20 H.O. Slugger Hammermill.
2—A.C. 6′ x 22′ Tube Mills, 300 HP motors.
1—Allis Chalmers #8722 Compeb Mill.

SCREENS—SEPARATORS

6—Tyler Hummer Screen, 4′ x 7′.
1—Link Belt 3′ x 8′ double deck Screen.
5—Rotex 40″ x 84″, 40″ x 120″.
4—Air Separators, 6′, 8′, 10′, 14′.

MISCELLANEOUS

3—Chicago 14″ x 7″ Compressors, 484 cfm.
2—Oliver Rotary Dewaterers, 8′ x 4′.
12—Bucket Elevators, 20′ to 75′ centers.
250 ft. Link Belt 12″ Troughing Conveyor.
1—10,500 gpm Centrifugal Pump, 135′ head.

Partial List
Your Inquiries Solicited

BRILL Equipment Company
2401 Third Ave., New York 51, N.Y.
Or
4101 San Jacinto St., Houston 4, Texas

FLOTATION EQUIPMENT complete including pulp sampler and distributor, mineral jigs, 6 cell flotation machines, super charger, agitator, 4″ concentrate pumps, reagent distributors, etc. Used only 300 hours.

FEEDER: Robins heavy duty Oro Rock Feeder 60″ x 14 ft. with 20 H.P. motor, reducer, etc. New condition.

GRIZZLY CONVEYORS: Robins Live Roll, one 5 x 48 x 16 and one 7 x 36 x 12.

PAN CONVEYOR: 48″ x 110 ft. complete with motor, reducer, etc., heavy duty type, designed for rock.

BALL MILLS: 9′6″ x 11 ft., NEW. Two Allis Chalmers 5 ft. x 22 ft. Tube Mills with steel heads.

ROD MILLS: 2—Marcy Open End size 5′ x 14′.

DRYERS: 5 ft. x 30 ft. complete with all auxiliary equipment. 2—Heavy duty 9′ x 70′ with all equipment, new condition.

JAW CRUSHERS: 9 x 15, 10 x 20, 15 x 36, 18 x 30, 24 x 36, 30 x 42, 42 x 40, 48 x 60, with or without motors.

MOTOR: G.E. 50 H.P., 2200 volt, 3 phase, 60 cycle, 450 RPM, with control equipment.

LOCOMOTIVE CRANE: 25 ton capacity, standard gauge, gasoline powered, cast steel trucks, air brakes, with or without 1¼ yd. Williams clam shell bucket, thoroughly modern, excellent condition. Located Minnesota. For sale or rent.

MINE HOISTS: Single and double drum 100 to 1500 H.P., with all electrical equipment. Complete specifications, drawings, photos available.

HOIST MOTORS:
300 H.P., 435 RPM. 600 H.P., 710 RPM.
400 H.P., 588 RPM. 1200 H.P., 444 RPM.
2200 volt, A.C., with controls.

We Buy and Sell Equipment Throughout North and Central America

A. J. O'NEILL
Lansdowne, Pa.
Phila. Phones: MAdison 3-8300 - 3-8301

54″x70″ Bird solid bowl CENTRIFUGE.
10″ portable Suction DREDGE.
100 ton GE Diesel Elec. std. ga. LOCOMOTIVE.
AIR COMPRESSOR: Sullivan WJ3 855 CFM.
BARGES: 160½x34x10′ high w/cargo boxes.
DRYERS: 30″x8′, 4x31, 54″x20, 6x50, 7x110.
MILLS: 5x10, 6x8 Ball, 4x11, 5x10, 5x14 Rod. Gruendler 4XC, 6XD, 3624, CR3033 Hammer.
CRUSHING PLANTS: CR 2 unit port. Diamond 95.
CRUSHERS: 8x10 Sturtevant, 9x16 CR port. 1218 Acme, 1536 Diamond, 1836 Iowa port. 1836, 1838 & 2036 Austin West, 2436 Lippmann, 2536 Telsmith, 4042 & 4836 Farrell, 4248 Traylor JAW.9K Gates, 10, 16, 30″ McCully, 2′4″ Traylor GYR. 3018 & 4022 DBL Roll, 36″ Lippmann Gyraconers.
SHOVELS & DRAG: Marion 381, 480, 490, 7200. Page 621, Koehring 1005, Link Belt K595, Lorain L41, 820, BE 54B, 120B, 175F.
Equip. Here: 100 ton Bin, 2432″ Ball Mill.
Repres: Bonded Scale and Machine Co.

MID-CONTINENT EQUIPMENT CO., INC.
8321 Gannon St. Louis 24, Mo. Wydown 1-2826

DRILLS FOR SALE

Two (2) Bucyrus Erie 27-T Churn Drills, used but in good condition.
Price #1—$4800.00
Price #2—$4000.00
One (1) Bucyrus Erie 29-T Churn Drill, in good condition. Price #3—$8800.00. New 1951.
Above drills electric motor driven, crawler mounted.
Large quantity of bits, drilling tools and spare parts.
In use until February, 1955, when change in drilling method made these surplus.
Can be inspected at our Quarry in Lowell, Vermont.

For further information contact:

THE RUBEROID COMPANY
HYDE PARK • VERMONT

FOR SALE BY OWNER

1 Hammermill—24″ x 24″ Eagle
1 Locomotive—8 ton, 36″ gauge Plymouth gasoline
1 Locomotive—12 ton, 36″ gauge Plymouth gasoline
22 Cars—2 yard capacity, 36″ gauge, Atlas Car and Manufacturing Company
2 Pumps—3″, Model C Wilfley
1 Screen 8′ x 8′ single deck, W. S. Tyler dewatering
6 Pumps—3″ Bingham Pump Company—Service liquid flotation feed 35′ head, 475 G.P.M.
18 Pumps—4″ Bingham Pump Company—Service liquid flotation feed 55′ head, 290 G.P.M.
24 Flotation cells—Morse Weining type—Size 42″ x 42″ x 42″

for further information contact J. H. Clements,

BASIC REFRACTORIES, INC.
Maple Grove, Ohio
Post Office, Fostoria, Ohio

CEDAR RAPIDS 25x40 r.b. Jaw Crusher Primary Plant, also including 42″x13′ apron feeder, hopper, by-pass grizzly, 100 hp. electric motor, V-belt drive. Variable speed feeder drive, mounted on factory assembled steel frame. 3 yrs. old. Excellent. $13,500.
CEDAR RAPIDS SUPER ROCK-IT PLANT w/22x 25 Jaw, 3033 hammermill, 4x10 2-deck screen rotovator, conveyors, mounted tandem rubber. No power. Bargain. $17,500.
CEDAR RAPIDS 2-Unit Portable Crushing Plant w/15x24 r.b. Jaw, feeder, underconveyor, power, mounted tandem rubber. Secondary plant with 16x24 r.b. Rolls, vibr. screen, rotovator, delivery conveyors, power, mounted tandem rubber. Capacity appr. 75 tph of 1¼″ minus. Excellent $12,500.
ROGERS 2-Unit Portable Crushing & Screening Plant w/24x36 r.b. Jaw crusher, apron feeder, underconveyor, GMC diesel power, mounted tandems. Secondary portable with 36x20 r.b. Double Roll Crusher, 4x12 3½-deck screen, GMC diesel, mounted tandem rubber. Make 4 sizes of product. Like new, 9 mos. old, used 30,000 tons material. Cost new appr. $75,000. Our price $52,500 Rental Purchase. Kansas City.
AUSTIN WESTERN Stationary Plant with 18x36 r.b. Jaw Crusher, apron feeder, mounted portable frame w/steel wheels, 24x50 conveyor, (2) 24x20 conveyors, Symons 3x10 2-deck horizontal screen, Gruendler 3XB hammermill. Capacity 75-100 tph of 1¼″ minus. Bargain $6500 Kansas City.
ROGERS 20x36 r.b. Jaw Crusher, exc. $4500. Yard.
CEDAR RAPIDS 3x8 apron feeder with hopper and stand, like new, $2000 Yard.
ALLIS CHALMERS 5x16 2-deck Lo-Head Screen, new Cost $5400 Sell for $4000.
AUSTIN WESTERN 10x40 r.b. Jaw Crusher, A1. $1850 Yard.
ROGERS 10x18 p.b. Jaw Crusher, exc. $400. Yard.
DIAMOND 24x36 r.b. Jaw Crusher, like new, $7850.
AUSTIN WESTERN 12x20 r.b. Jaw crusher with underconveyor, power unit, V-drives, on steel wheels. Good $1750 Yard.

WENZEL MACHINERY RENTAL & SALES CO.
565-567 South Tenth Street
Kansas City, Kans.
Mayfair 1-1710 1-1711

FOR SALE

1—Austin Western backhoe
1—Insley K 12 dragline, new 40′ boom
1—Portable crushing plant on rubber with 9x24 Jaw crusher, 24″ belt conveyor hopper, Deister screen, gas power unit V-belt drive. This is a complete plant.
1—New double pass portable plant.

If interested contact for further information

C. F. POEPPELMAN SAND & GRAVEL
Versailles, Ohio
Phone 57071

JAW CRUSHERS — 6″ x 3″ to 60″ x 48″

Before buying or selling any
FARREL-BACON JAW CRUSHERS
It will pay you to consult

BACON-PIETSCH Co., Inc.
Engineers & Manufacturers Send for Catalogue
22 Park Street
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Machine Shop Facilities
FEEDERS
Conveyors, Screens, etc.

RELAYING RAIL

Track Accessories
All Sizes

LEFTON INDUSTRIAL CORP.
General Office: 212 Victor Street
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FOR SALE

1—8″ Manganese dredge Pump, V Pulley drive—A-1 Condition $1500.00
1—Link belt twenty-five foot (25′) Dewatering Elevator. $1000.00

ANDERSEN SAND & GRAVEL CO.
1700 S. WEADOCK ST.
SAGINAW, MICHIGAN

FOR SALE

Crushing Plant, Diamond #35, 2½ Deck, 9 x 24 Jaw—Portable—Hopper and Plate Feeder — Feed Conveyor. Waukesha Gas. Motor. Very Good Condition. $7,000.00.

Meyer & Meyer Gravel Corporation
8375 Genesee Street, Lancaster, New York

FOR SALE

3 10″ McCully Gyratory Crushers.
3 Traylor No. 412 Type TZ Gyratory Crushers.
2 Traylor 8″ Gyratory Crushers.
1 New RCA Metal Detector 10″ x 36″ aperture
6 Used Single deck Robins Gyrex Screens with bases.
5 Used single deck Robins Vibrex Screens.
1 Used Cameron pump, size 10″, 2400 G.P.M., 125″ head, 1150 R.P.M. Left Hand, Serial No. 57537.
1 Used Cameron pump, size 10″, 2400 G.P.M., 125″ head, 1150 R.P.M. Right Hand, Serial No. 57535.
1 New Edison Voice Writer (Dictaphone).
1 Marion Model 490, Serial No. 6201, Ward Leonard Control, Also spare parts. In addition we have a substation 2300/440 Volt with three 150 KV9 Transformers.

New York Trap Rock Corporation
230 PARK AVENUE NEW YORK 17, N. Y.

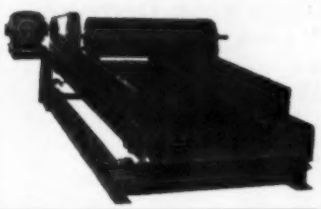
BONDED EQUIPMENT BARGAINS

IMMEDIATE SHIPMENT FROM OUR FACTORY — WRITE, WIRE OR PHONE

NEW BONDED® HEAVY DUTY VIBRATING SCREENS

Model Number	Screening Area	No. of Decks	Sale Price
124AS	2' x 4'	1	$355
224AS	2' x 4'	2	375
126AS	2' x 6'	1	375
226AS	2' x 6'	2	395
136AS	3' x 6'	1	495
236AS	3' x 6'	2	585
336AS	3' x 6'	3	815
138AS	3' x 8'	1	575
238AS	3' x 8'	2	695
338AS	3' x 8'	3	845
138BS	3' x 8'	1	1119
238BS	3' x 8'	2	1165
338BS	3' x 8'	3	1250
248BS	4' x 8'	2	1695
348BS	4' x 8'	3	1850
2410BS	4' x 10'	2	1775
3410BS	4' x 10'	3	2095
3412BS	4' x 12'	3	2395

NEW BONDED® GENERAL DUTY VIBRATING SCREENS



For mineral, chemical and other industrial products. Fast, efficient and economical for cleaning, sizing, grading, dewatering. Made in all metals including stainless steel. Enclosed models for hot materials or dust control. Bonded screens are built for any screening operation, wet or dry. HEAVY DUTY MODELS, TYPE BS: 4-bearing positive throw, eccentric shaft; 3' x 8' to 5' x 14', 1 to 5 decks. GENERAL DUTY SCREENS, TYPE AS: eccentric weight mechanism, spring mounted, 1 to 3 decks, 2' x 4' to 3' x 8'. Write for new 8-page Bulletins 1086 and 1087.

BONDED CARRIES LARGE STOCKS OF SCREEN CLOTH FOR IMMEDIATE SHIPMENT

NEW BONDED® TROUGHING IDLER CONVEYOR BARGAINS

Complete Ready-Fab sections quickly and easily joined together on the job. We take our loss on our stock of short length belting. You can save as much as 50% on the BONDED CONVEYOR SPECIALS listed, with conveyor belting in two pieces. Conveyors are equipped with 5" roll diam. idlers and return rolls, 20" diam. head pulley and 16" diam. tail pulley mounted on 2¼" or 2-7/16" diam. shaft. Belt is new 4-ply, 28-oz. duck, ⅛" top rubber cover x 1/32" bottom cover and is fresh stock made by leading manufacturers.

CONVEYOR PRICES INCLUDE BELTING

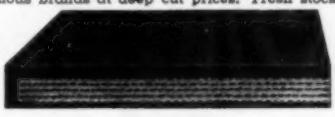
Belt Width	Length of Conveyor	List Price	Sale Price
14"	25'	$1166	$ 672
14"	50'	2016	1064
14"	85'	3206	1612
16"	20'	1083	592
16"	45'	1928	1012
16"	60'	2494	1264
18"	25'	1327	739
18"	45'	1986	1085
18"	85'	3466	1798
18"	100'	4001	2065
20"	25'	1366	770
20"	60'	2762	1426
20"	90'	3959	1995
24"	25'	1428	835
24"	45'	2227	1237
24"	70'	3226	1744
24"	100'	4425	2339
30"	50'	2669	1504
30"	70'	3576	1971
30"	90'	4483	2432
36"	25'	1632	1040
36"	45'	2492	1561
36"	60'	3327	1950
36"	100'	5102	2990

For conveyors longer or shorter than those listed above, add or deduct the following per foot prices according to belt width. Prices include belting.

For 14" belt	$15.66	per foot
For 16" belt	16.78	per foot
For 18" belt	17.90	per foot
For 20" belt	18.95	per foot
For 24" belt	20.66	per foot
For 30" belt	23.02	per foot
For 36" belt	26.00	per foot

NEW CONVEYOR BELTING SAVE UP TO 25%

Heavy duty 4-ply, 28 oz. duck ⅛" top rubber cover by 1/32" bottom cover 12# to 15# average friction pull; 800# to 1000# average cover tensile rubber belting having high tensile strength, tough cotton duck, strong carcass and proper flexibility. For heavy boxes, bags and bulk materials. Troughs easily. Famous brands at deep cut prices. Fresh stock.



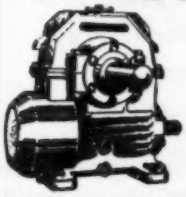
Width	List Price	Sale Price
14"	$3.43 foot	$2.75 foot
16"	3.85 foot	2.98 foot
18"	4.27 foot	3.19 foot
20"	4.69 foot	3.69 foot
24"	5.55 foot	4.14 foot
30"	6.77 foot	5.06 foot
36"	8.01 foot	6.00 foot

A high grade of heavy duty 4 and 5-ply, 28 oz. duck, ⅛" top rubber cover x 1/32" bottom rubber cover, 16# to 19# average friction pull, 2500# to 3000# average cover tensile belting. For more severe service, high tonnages and abrasion resistant. For handling stone, mineral ores, concrete, cement, coal and other similar materials, both wet and dry. Belt has molded rubber edge.

Width	Ply	List Price	Sale Price
18"	4	$5.09 foot	$3.72 foot
20"	4	5.57 foot	4.03 foot
24"	4	6.56 foot	4.80 foot
30"	4	8.05 foot	5.89 foot
24"	5	7.68 foot	5.61 foot

Additional widths and plies available at low prices. Write for Free Sample.

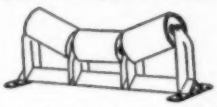
NEW BONDED GEAR REDUCERS



H.P. At 20:1 Ratio	H.P. At 30:1 Ratio	Price
3	2	$ 91
5	3	142
10	7½	228
15	10	286
20	15	394
25	20	468
30	25	575
40	30	750
60	50	925

Reducers are right angle with worm on bottom (underdriven) and all models are fan cooled by means of a radial fan. Reducer will operate in either direction. Other sizes and ratios available at bargain prices.

NEW IDLERS AND RETURN ROLLS 25% BELOW LIST PRICE

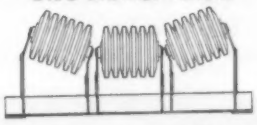


3-roll, 5" diameter Troughing Idlers for:			
14" belt	$17.25	24" belt	$19.75
16" belt	18.00	30" belt	20.50
18" belt	19.00	36" belt	21.25
20" belt	19.25	48" belt	23.75

1-roll, 5" diameter Return Idlers for:			
14" belt	$6.75	24" belt	$ 8.00
16" belt	7.00	30" belt	8.75
18" belt	7.50	36" belt	9.25
20" belt	7.75	48" belt	10.75

All steel. Interchangeable with other well-known makes. Furnished with easily replaceable pre-lubricated Sealed ball bearings. Also can be furnished with greasable type Alemite Fitted bearings. Maintenance is negligible.

NEW BONDED RUBBER DISC IMPACT IDLERS



Impact idlers are used at the loading end or transfer points of troughing idler conveyors to absorb shock of heavy material falling on belt, thus reducing damage to belt. This cuts production costs and extends belt life. Rolls are made of a series of specially designed impact absorbing rubber discs mounted on steel tubing with easily replaceable sealed ball bearings. Also can be furnished with greasable type alemite fitted bearings. Interchangeable with Bonded standard idlers and other well known makes. Flat and return belt impact idlers available on application.

14" belt	$58.00	24" belt	$100.00
16" belt	69.00	30" belt	110.00
18" belt	80.00	36" belt	130.00
20" belt	90.00	48" belt	172.00

BONDED MAKES A FULL LINE OF CONVEYOR PARTS, ACCESSORIES AND PARTS TO BUILD YOUR OWN CONVEYORS.
WRITE FOR BULLETIN #1138 AND/OR BULLETIN #938 ON FEEDERS

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M.G. SETS • GENERATORS
Hoists • Compressors • Transformers
Units of Every Size and Description

SLIP RING MOTORS

3 phase, 60 cycle, 220 or 440 volts (*2300 volts or higher)

H.P.	Make	Type	Speed
2000	*G.E.	MT	600
1250	*Al-Ch.	ANY	1800
1250	*Westg.	CW	600
1000	*Westg.	CW	250
700	*Al-Ch.	ANY	1200
600	*G.E.	MT	450
500	Westg.	CW	350
500	Westg.	CW	900
400	Al-Ch.	3 brg.	450
300	*G.E.	IE-15A	1800
250	*G.E.	I-M	450
250	Westg.	HP-15H	600
200	G.E.	IK-15B	900
200	G.E.	IM	600
150	Cr. Wh.	50-R	1800
150	G.E.	MT-549	1800
150	*Wagner	RS-131	900
150	Westg.	CW	450

SQUIRREL CAGE MOTORS

3 phase, 60 cycle, 220 or 440 volts (*2300 volts or higher)

H.P.	Make	Type	Speed
1250	*Al-Ch.	ANX	3600
1200	*Al-Ch.	ARW	1200
750	*Westg.	CS	900
500	*Al-Ch.	ARW	3600
500	*G.E.	KT5698	900
500	G.E.	KT-424	450
450	*Al-Ch.	ARW	1800
400	G.E.	KT-424	360
300	*G.E.	K-6344Y	1200
300	G.E.	K-6353TEFC	720
250	Westg.	CS-TEFC	1800
250	G.E.	KT-559	1800
250	*L.-Allis	6EX-148	720
250	*G.E.	IK	600
250	G.E.	IK-17A	600
250	Westg.	CS-14	514
250	*Gr. Wh.	SC-68	900
200	*G.E.	FT-549Y	3600

AND MANY OTHERS

WE'LL SELL, BUY OR TRADE
PHONE CANAL 6-2900

CHICAGO *Electric Co.*

1329 W. CERMAK ROAD
CHICAGO 8, ILL.

FOR SALE

CLASSIFIER—Dorr 26' bowl with 5' x 30' rakes.

HAMMERMILL—S-6 Pennsylvania. 25 TPH.

CRUSHER SHAFT—with bearing assembly for 1540 Champion Good Roads Crusher.

G. & W. H. CORSON, INC.
Plymouth Meeting, Pa.

EQUIPMENT BARGAINS ALL OVER THE COUNTRY

2', 3', 4' Symons—GYRATORIES—JAW CRUSHERS—ROLLS 3020 & 4022—HAMMERMILLS 36 x 36 Jeffrey, 36 x 30 Dixie, #20 Williams, 4033 Cedar Rapids, 42 x 48 Williams, Cedar Rapids double impeller impact breaker port. plant—PLANTS Pioneer 305-W & Cedar Rapids Jr. washing—1836 & 2436 primary—1538 primary $7,000—two unit plant 15 x 24 jaw & 24 x 24 roll $18,000—Cedar Rapids Jr. & Super tandems—port. with 8 x 24 jaw & 16 x 20 rolls— ROD, BALL, TUBE MILLS 5 x 10, 5 x 14, #86, #96, 5 x 22, 6 x 22—LOCOMOTIVES 20 & 105 tons—KILNS & DRYERS 8 x 123, 7 x 110, 10 x 105—SHOVELS & DRAGS 7W Monighan—120-B, 110-B, 54-B—P & H 1600, 955, 1055—N.W. 88-D & 6—Manitowoc 4500—Marion 111M, 7200, 7400—American revolver crane R-10—1300 cfm PRE 2 compressor—Wemco #3 heavy media separation mill—42" x 21' feeder—600 hp & 850 hp sgl. drum hoists—36" x 19' spiral classifier—Lidgerwood Travelift cableway 25 ton hook load. Many other items.

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Openings include design, development, field engineering and sales opportunities.

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Training program available to supplement technical background and experience. Barber-Greene is one of the outstanding growth companies, which offers life-time careers to outstanding men.

Sumbit resume outlining background, salary desired, etc., to: Personnel Manager

Barber-Greene

AURORA, ILLINOIS

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CRACKS REPAIRED
MACHINED READY-TO-INSTALL
VALVE GRINDING PRESSURE
& MAGNETIC TESTED

CATERPILLAR BUDA G.M.C.
INTERNATIONAL, ETC.
Gas & Diesel

CHAPIN CYLINDER HEAD CO.
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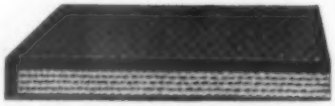

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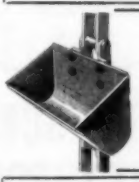

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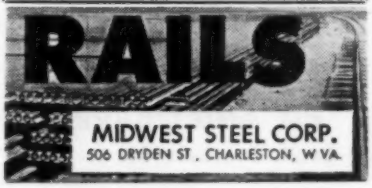

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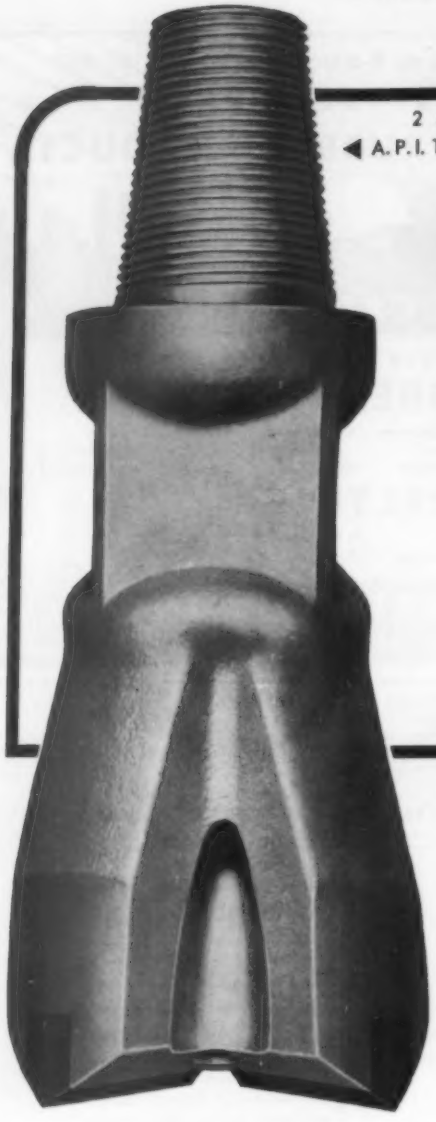

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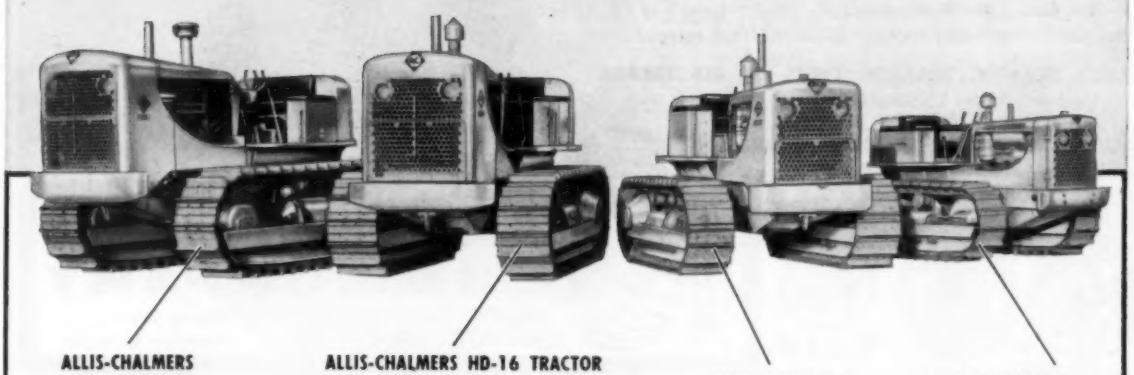

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Weight — 31,500 lb
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Torque Converter Drive
Hp — 150 net engine
Weight — 31,600 lb
Drawbar pull — up to 60,000 lb

ALLIS-CHALMERS HD-11 TRACTOR
Hp — 85 belt
Weight — 20,500 lb
Drawbar pull — up to 21,980 lb

ALLIS-CHALMERS HD-6 TRACTOR
Hp — 55 belt
Weight — 12,400 lb
Drawbar pull — up to 12,650 lb

HERE IT IS . . . the all-new Allis-Chalmers line of crawler tractors . . . with more of everything you've wanted most for steady output—more work power, more long-life features, more easy maintenance and easy operation features, more versatility in every tractor.

You get all the benefits of Allis-Chalmers advanced basic design with the new Allis-Chalmers diesel engine . . . proved torque converter drive for the HD-21 and HD-16 . . . all-steel box-A main frame . . . unit construction . . . 1,000-hour lubrication intervals for truck wheels, idlers, support rollers . . . double-reduction final drives, and many other profit-producing features.

And there's a complete spread of tractor equipment — hydraulic and cable dozers, heavy-duty winches, hydraulic rippers. You can choose from a full line of tractor shovels ranging from 1½-yd to 4-yd capacity.

Behind this equipment are dealers with sales and service personnel and facilities that assure you expert "after sales" care. The True Original Parts they stock help give you continued top performance and long equipment life.

Your Allis-Chalmers dealer will show you how these feature-packed crawlers can do your jobs better and at lower cost. See him for full details.

ALLIS-CHALMERS, CONSTRUCTION MACHINERY DIVISION,
MILWAUKEE 1, WISCONSIN

ALLIS-CHALMERS

Money Saving Coordination Southern Tire's GIANT TIRE RETREADING

Experienced contractors will recognize time and money-saving coordination in use of heavy equipment in this picture of an Oman Construction Company, Inc. highway job.

Southern Tire Company is maintaining the drive tires on every piece of equipment on this job . . . another way that Oman's saves time and money.

Pickup and delivery, at the job site after work hours, by Southern Tire representatives will help you get the most from your equipment by minimizing downtime. Southern Tire's giant retreads help you save money on tire replacements, as well—savings up to 40% compared to the cost of new tires.

Let Southern Tire retreading service help you. Call your tire dealer now and specify Southern Tire retreads.

ROCK SERVICE, TRACTOR TYPES OR RIB TREADS
All sizes from 1100 x 24 to 2700 x 33, and new sizes 29.5 x 25 and 29.5 x 29.

SUPERIOR THREE-SECTIONAL MOLDS
Three—Sectional molds assure no buffing to breaker strips, regardless of growth.

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FLORENCE, ALA.

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Florence 85 or 86

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More Strength

More Capacity and

Engineered Performance

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CROSS Perforated Steel Sections and Decks for VIBRATING — SHAKING — REVOLVING SCREENS

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Manufacturers • Carbondale, Pennsylvania • Telephone: 300

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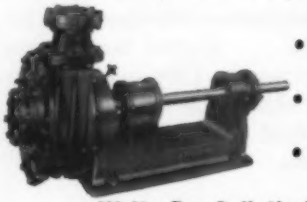
IT'S FULLY LINED

SAND GRAVEL and SLURRY

You'll get more service, more production with Krogh Pumps because they are 100% lined with hard chilled alloy cast iron for maximum abrasion resistance, or alloy steel for impact strength when handling rock. Liners (available from stock) are easily installed. External wear-take-up adjustment extends operating hours. Design of Krogh Pumps makes them especially suited for handling high concentrations and maximum size particles with suction lift against high head with low rotative speed.

Proven By 80 Years Experience!



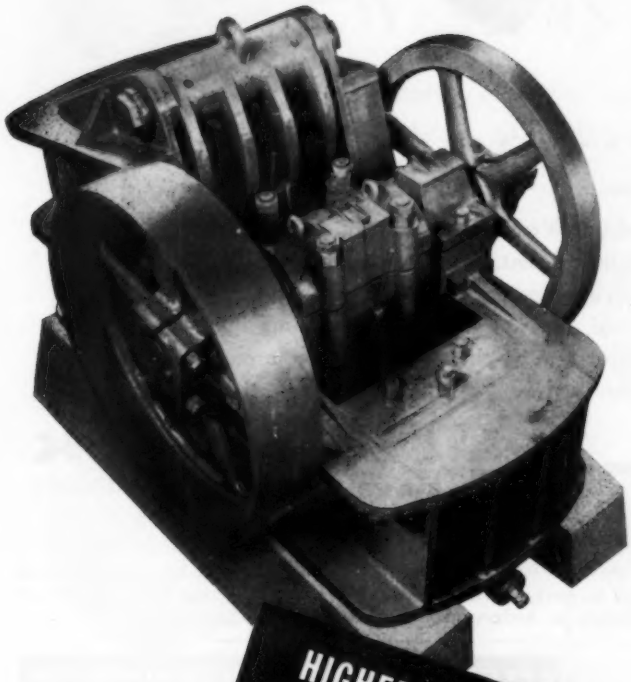
- More Capacity
- Less Wear
- More Production

Write For Bulletin No. 313-1

KROGH PUMP and Equipment Company

515 Harrison St.
San Francisco 5, Calif.

AN UNBEATABLE COMBINATION FOR MORE PROFITABLE MATERIAL CRUSHING



HIGHER TONNAGE

LOWER PRODUCTION COST

REDUCED MAINTENANCE

For over a half-century Traylor has been designing and building heavy-duty primary crushers for the nation's leading producers. These operators know from experience that the job-proven features of Traylor Jaw Crushers assure greater hourly output, lower production costs and longer, maintenance-free operation.

Traylor original non-chokable curved jaw plates apply power more efficiently . . . as a direct crushing force. The increased capacity of each successive feeding zone in the crushing chamber reduces choking and packing. Normal wear, as it gradually occurs, is evenly distributed over the entire surface of the plate . . . as a result *Traylor curved jaw plates often outlast conventional plates by as much as 3 to 1.*

As a direct result of their more efficient application of crushing power, Traylor Jaw Crushers require less power per ton produced than any other jaw crushers. Traylor Jaw Crushers are built in four different types, each in a wide variety of sizes. Feed openings range from 8″ x 12″ to 60″ x 84″; capacities from 4 to 1000 tons per hour.

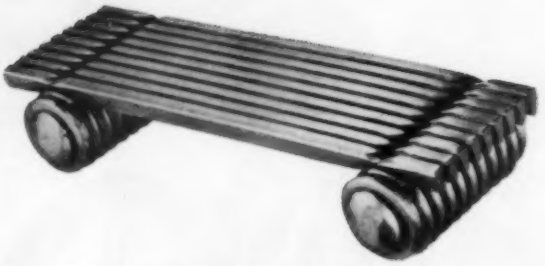
Write for copies of Traylor Jaw Crusher Bulletins giving complete specifications, illustrations and descriptions.

TRAYLOR ENGINEERING & MFG. CO.
808 MILL ST., ALLENTOWN, PA.
SALES OFFICES: New York • Chicago • San Francisco
CANADIAN MFR.: Canadian Vickers, Ltd., Montreal, P. Q.

Traylor

JAW CRUSHERS

THE LAST WORD IN SCREENING EFFICIENCY



The word's out on wedge wire and Hendrick has it!

That's right. With the addition of new Hendrick Wedge Wire, Hendrick now makes available a complete line of screens for the best in efficient, low-cost screening, de-watering and filtering operations. It's ideal wherever it is important that screen openings be minutely fine, have excellent draining qualities and a high degree of accuracy and rigidity. For details on how Hendrick Wedge Wire can best be applied to your specific requirements call your nearby Hendrick Sales Engineer.

SEE OUR CATALOG IN SWEET'S

Hendrick
MANUFACTURING COMPANY

39 DUNDAFF STREET, CARBONDALE, PA.

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Perforated Metal • Perforated Metal Screens • Wedge-Slot and Hendrick Wedge Wire Screens • Architectural Grilles • Mitco Open Steel Flooring • Shur-Site Treads • Armorgrids • Hendrick Hydro-Dehazer

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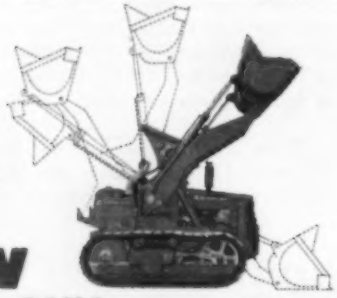
LODOVER



NOW
OVERHEAD PLUS FRONT END LOADING COSTS NO MORE WITH LODOVER!

This versatile combination overhead and front-end loader costs no more than conventional front-end loaders . . . yet loads more dirt, faster with your International T-9 or TD-9 than any other loader on the market today!

ONLY LODOVER GIVES YOU

50% MORE YARDAGE—no-turn overhead operation eliminates two turns every cycle, doubles yardage every hour

EXTRA DIGGING POWER—twenty-five degree bucket tilt-back at ground level pries out a full bucket every time

REDUCED TRACTOR MAINTENANCE • SAFE, EASY HYDRAULIC OPERATION • HIGH-SPEED FRONT-END LOADING

A complete line of job-tested attachments makes Lodover the most versatile multi-purpose unit you can buy to boost profits on your job. An on-the-job Lodover demonstration will convince you . . . arrange for one today!

SERVICE SUPPLY CORPORATION
30TH & ERIE AVENUE • PHILADELPHIA, PA.

SPEED REDUCER-CLUTCH COMBINATION

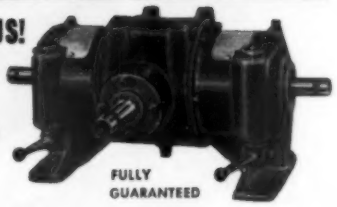
Farm and Industrial **TRANSMISSION**

Brand New SURPLUS!

Gov. Cost $262.00

Only $69.50 PREPAID

Speed Reducer alone worth triple this price!



FULLY GUARANTEED

- **Reduces speed at a 3-to-1 ratio**
- **2 Independent Outlet shafts, each separately controlled by its own Clutch**
- **Rated up to 3.6 HP (electric) or 7.5 HP (gas engine)**
- **Ball and Taper Roller Bearings thruout (smooth, quiet)**

There are unlimited farm and industrial uses where this **SPEED REDUCER-CLUTCH COMBINATION** can be utilized when low speeds are required—for starting heavy loads—or—for engaging and disengaging machine operation without stopping the input drive. Use with any ¾-HP to 3.6-HP motor (or 1-HP to 7½-HP engine). With input speed of 1800 RPM, ratio of 3-to-1 gives approx. 580-RPM output speed (or can be belt driven to give **ANY DESIRED SPEED**). Clutches are of double disc design with non-burning asbestos friction rings . . . and have simple one point adjustment to take up for any wear. Close grain cast iron and steel construction. Standard foot mountings. Shaft sizes: input, 1-3/16" diam., 3½" long; output, 1⅛" diam., 2½" long.

Can be easily adapted to present drives—or for building special equipment that increases production and saves valuable man hours. A unit of this type is rarely available and hard to obtain **AT ANY PRICE!** Its versatility makes possible the mechanization of operations that would ordinarily be too expensive to modernize. Some of the countless applications are: machine tool drives; construction and farm machinery and equipment; winches, lifts, hoists, etc. **A REAL ENGINEERING ACHIEVEMENT IN EFFICIENCY AND COMPACT DESIGN.** Weight 108 lbs. Approx. size, 17½" long x 8" wide dia.

ORDER DIRECT FROM AD! We Pay Shipping Costs!

FREE CATALOG of Hydraulics, Generators, Other SURPLUS

ROBERTS ELECTRIC CO.
DEPT. PQ-391

849 W. GRAND, CHICAGO 22, ILL.

For the Maximum in Air Pollution Control

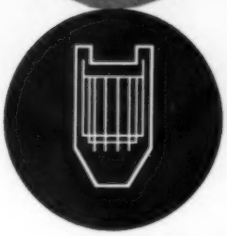
An unbiased recommendation from

WESTERN PRECIPITATION

The only organization with 48 years of dust collection experience.

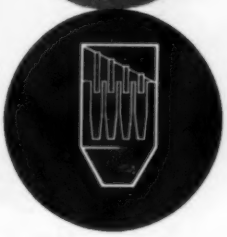
ELECTRICAL, MECHANICAL *and* FILTER *types of recovery systems.*

COTTRELL *Electrical* PRECIPITATORS



Western Precipitation pioneered commercial application of the now-famous Cottrell **Electrical** Precipitator—has more know-how, more experience, more basic advancements in this highly-technical electrostatic field of recovery than any other organization, domestic or foreign.

MULTICLONE *Mechanical* COLLECTORS

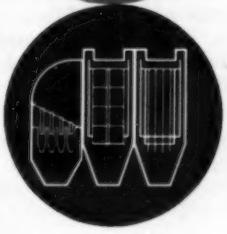


Western Precipitation pioneered the multiple small tube type of cyclonic collector—the type with higher centrifugal forces for greater recovery efficiencies. Multiclones are also easier to install, service and maintain—and require less space than other equipment of comparable capacity.

DUALAIRE *Reverse Jet* COLLECTORS

This is the filter-type recovery unit that continuously and automatically maintains filter porosity with virtually the entire filter area in service as it filters the gas. Cleans without jarring or rapping... pressure drop remains uniformly low, filter capacity remains uniformly high because no thick filter cake ever forms to reduce effectiveness. Actual field tests show collection efficiencies higher than 99.99%.

ALSO... *Combination* SYSTEMS!



A Combination Multiclone and Precipitator (CMP), for example, combines in one compact unit the advantages of the Multiclone for removing the heavier particles (down to a few microns in size) and the advantages of the Precipitator for final clean-up. Result—high overall recovery efficiency at very nominal overall cost—almost constant collection efficiency despite varying gas volume.

Let us send you literature which describes Western Precipitation's unique services in greater detail. Write, wire or phone our office nearest you!

wp

COTTRELL Electrical Precipitators
MULTICLONE Mechanical Collectors
CMP Combination Units
DUALAIRE Reverse-Jet Filters
HOLO-FLITE Processors

Western Precipitation Corporation

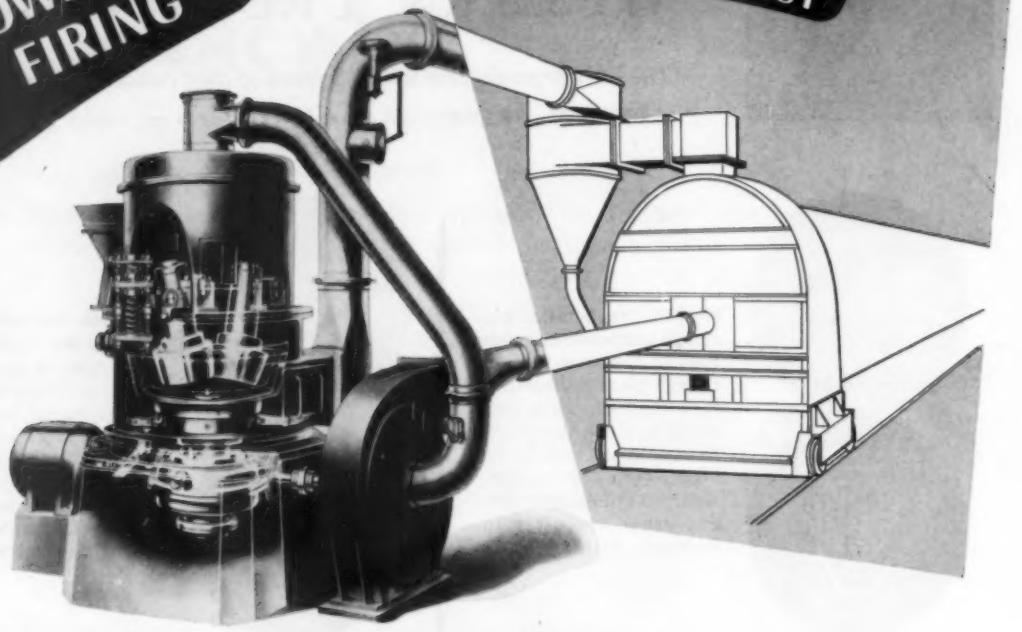
Designers and Manufacturers of Equipment for Collection of Suspended Materials from Gases and Liquids

***Main Offices:* 1015 WEST NINTH STREET, LOS ANGELES 15, CALIFORNIA**

Chrysler Bldg., New York 17 • 1 North La Salle Street Bldg., Chicago 2 • Oliver Bldg., Pittsburgh 22 • 3252 Peachtree Rd. N. E., Atlanta 5 • Hobart Bldg., San Francisco 4 • Precipitation Co. of Canada Ltd., Dominion Sq. Bldg., Montreal

Raymond BOWL MILL FIRING

TOP LEVEL KILN EFFICIENCY



Modernize Your Rotary Kiln Operation...

with the Raymond BOWL MILL . . . a complete, fully coordinated system with flexible control and automatic operation. This modern direct-firing unit is specifically designed and built for its job. It not only provides utmost economy in coal pulverizing but also delivers a proper coal-air mixture to the burner to insure maximum kiln performance.

Producers of cement, lime and dolomite are equipping their new plants with batteries of Bowl Mills . . . or converting their old plants, one by one, to modern Bowl Mill installations. Increased savings and advantages are due to these Bowl Mill features:

(a) Handles coal of any grade or moisture content
(b) Easily adjusted or lubricated while running
(c) Sturdily built for continuous 24-hour operation
(d) High availability and wide range capacity

For a better product, lower costs and dependable performance . . . choose the Bowl Mill on its 20-year record . . . over 2000 now in use.

VISUAL CONTROL PANEL

Write for the new Raymond Catalog #75

Raymond control system gives complete operating picture of mill at all times, and permits easy supervision of one or several Bowl Mills.

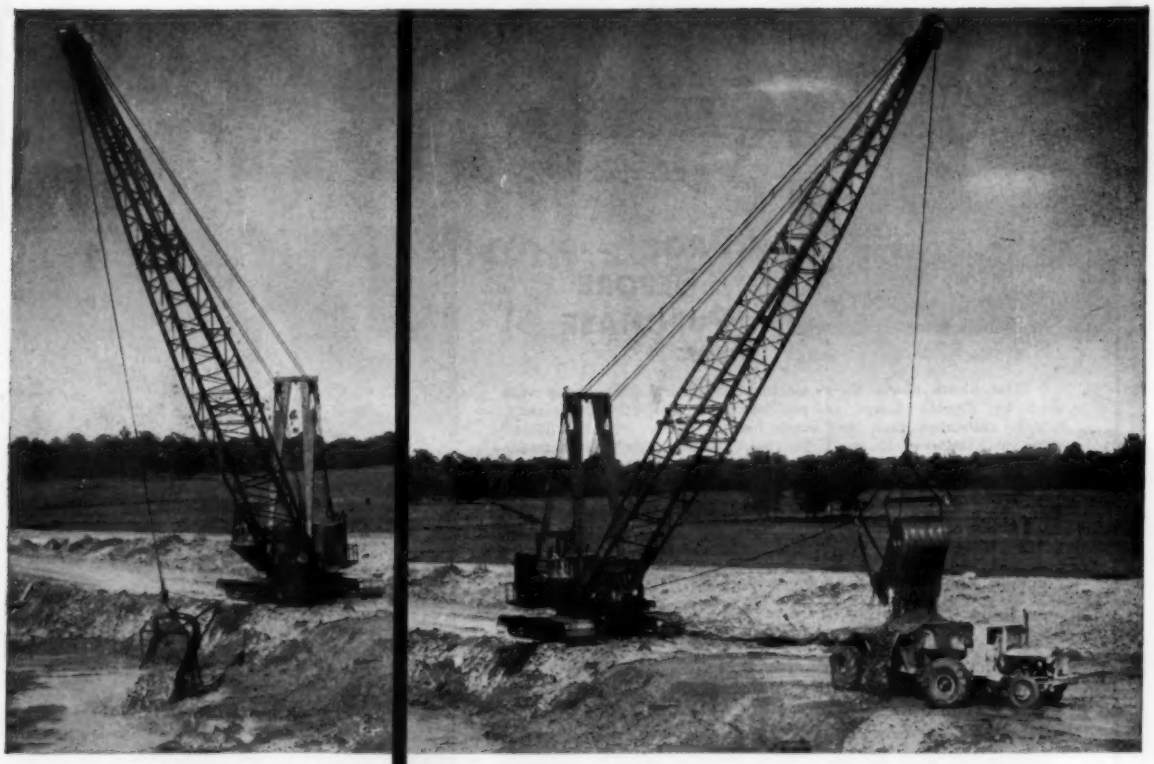
COMBUSTION ENGINEERING, INC.

Raymond Division

1321 North Branch St.
Chicago 22, Illinois

Combustion Engineering-Superheater Ltd. • Montreal, Canada

SALES OFFICES IN PRINCIPAL CITIES



Manitowoc mobility and stability delivers big yardage at Dutch Gap

To keep material moving at a rapid rate into its screening and processing plant, Southern Materials Co., Chester, Va., uses a big capacity Manitowoc 4500 dragline to get the job done fast, at lowest cost. This massive Manitowoc, equipped with a 5-yd. perforated bucket, delivers to loading units an average 12-yds. of sand and gravel from the James River every 3 to 4 minutes. A 120′ boom provides extended reach for full buckets at maximum working range.

MONEY-SAVING MOBILITY

Here's a 5-yarder that's as mobile as a lightweight — with the stability and balance you need under all conditions. Wide, 60″ pads and lowest bearing pressure make traveling easy in soft going. The absence of cumbersome electric trailing cables speeds movement on the job. Thousands of hard-to-maintain electrical wires and components are eliminated by the effective diesel unit drive pioneered by Manitowoc. The entire unit can be shipped by railway cars or highway trailers and assembled in days rather than the weeks required for other machines of comparable capacity.

MAXIMUM OPERATOR CONVENIENCE

Air controlled throughout for all operating clutches and brakes to lessen operator fatigue. Torque converter available to balance power to load for peak performance with or without first-class operator. Elevated pilot house raises operator's eye level to 15′ for full vision over banks and makes for fast, sure spotting when loading.

SEE YOUR MANITOWOC DISTRIBUTOR

Want a big capacity machine with all the finest features in your pit? Then get all the facts on the Manitowoc 4500. MANITOWOC ENGINEERING CORP., MANITOWOC, WIS.

MANITOWOC

SHOVELS 1-5½ YD. Speedcrane CRANES 20-100 TON

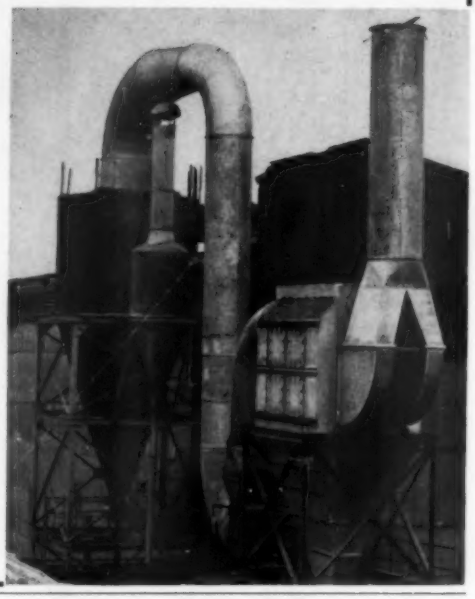
←P.B.P.*

*PROOF - - - - - BEFORE PURCHASE

The photo above shows simple but accurate test equipment used by Dustex Corp. to pre-determine collection efficiency, hourly collection rate, and stack losses, if any, to be expected after installation of Dustex Collectors. Testing is performed under operating conditions, without interrupting production, and at no cost or obligation.

The photo at right shows a recently installed Dustex Collector, purchased after thorough testing as outlined above. The Dustex is installed secondary to a large cyclone, collecting natural cement fines resulting from a rotary kiln drying operation at the Louisville Cement Company of New York Plant, Akron, New York.

RESULT: End of serious dust nuisance *plus* saving of usable product.



dustex CORP. P.O. BOX 2520 BUFFALO 25, N.Y.

New! Versatile! Portable!

MOBILE
All-Hydraulically
POWERED DRILL
MODEL B-40

Light, powerful, low-cost drilling! Mounts front, rear, or side of all vehicles, including wheel or crawler tractors. Cores with air or water to 200′, augers to 75′. Converts to any degree in 360°. One man operated. Ideal for all tough exploratory jobs!

Write for information on complete line of Mobile Drills.

MOBILE DRILL

World's Largest Mfgr. of Light Vehicle Powered Drills

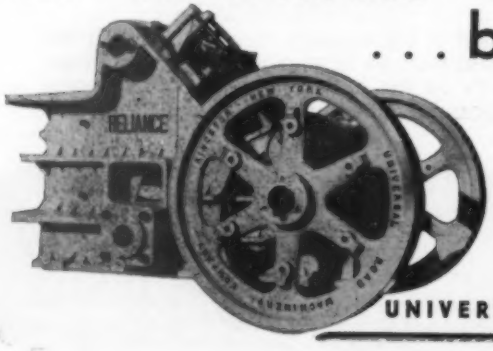
MOBILE DRILLING, Inc. • 802 N. Pennsylvania St. • INDIANAPOLIS 4, INDIANA

PLATEGRIP
PLATE FASTENERS FOR CONVEYOR BELTS

Make strong dust-tight, water-tight joints in belts of any width. Special design spreads tension uniformly across belt, allow natural troughing of belt and assures smooth operation over flat, crowned or take-up pulleys. Sizes for belts of from 1/4" thickness. *Write for Catalog Sheet.*

ARMSTRONG BRAY & CO.
5394 Northwest Highway, CHICAGO 30, U. S. A.

The "IRON HORSE" of HEAVY DUTY CRUSHERS
. . . built by RELIANCE



"It's a horse for work" . . . perfect description of this massive RELIANCE unit, with *built-in* life-time service. Greater weight gives more stability . . . results in minimum operating and upkeep costs. Designed with long jaw plates adjustable for all fineness ranges.

RELIANCE builds crushing, screening and washing plants from 50 to 1500 tons per day capacity.

Write Today for Bulletin

UNIVERSAL ROAD MACHINERY CO., Kingston, N. Y.

"You can say that again"

Thomas Phillips is a Big Name in small bags..

THE design and manufacture of smaller paper bags—from 2 to 50 lbs. capacities—has been a big part of the business of Thomas Phillips for 84 years. Single, duplex or multiwall . . . self-openers . . . flat or satchel bottoms . . . open mouth or valve . . . poly-coated or special paper . . . for flour, grain, fertilizers, insecticides, seed, paint, dog food—anything that can be bagged.

Thomas Phillips, too, is an integrated mill—from pulp to finished product—making much of our own special paper. Our composition, rope kraft, or coated blue lined flour bag paper, is one of the softest and most porous available today. And, we maintain complete art, plate and printing departments to assure you the finest reproductions possible.

There is a difference in bags . . . and service after sale . . . so why not place a trial order with Thomas Phillips.

Remember, too, that Thomas Phillips is a leading producer of multiwall bags up to 100 lbs. capacity, and we will ship in mixed car lots to suit your production schedules.

THOMAS PHILLIPS COMPANY • AKRON, O.

FLEXIBLE, 2-BEARING IDLER

cuts belt conveyor maintenance 90%

Still on the go after 2½ "no-down-time" years handling abrasive foundry sand, with a 90% reduction in idler maintenance—that is the record of a unique belt conveyor idler, the Joy *Limberoller.*

Other installations include successful handling of sticky, corrosive triple super-phosphate and fertilizers, potash, wet concrete mix, hot coke, coal, sticky iron ores, trap rock, with up to *eleven times* the service life of former idlers on the same jobs.

Resilient discs on a flexible steel cable, the Joy *Limberoller* has only 2 bearings, up out of the dirt. It conforms to the load, cushions and guides belt; needs no lubrication. It resists dust, abrasion, corrosion and material build-up—thus avoids fouled bearings; minimizes chemical and mechanical wear.

The *Limberoller* weighs ⅔ less than a conventional steel idler; is locked by a simple cotter key into special lightweight stands for easy installation and removal. No cover sheets are needed. Two types of stands are available: one that bolts to conventional rigid sections; and a self-supporting type that forms its own easily-erected portable sections without bolts, by using special stiffening rails.

Because of these unique features, many companies have adopted *Limberollers* as standard for all belt conveyor operations. *Limberollers* are available for belt widths of 18″—42″. Details from **Joy Manufacturing Company, Oliver Building, Pittsburgh 22, Pa.** In Canada: *Joy Manufacturing Company (Canada) Limited, Galt, Ontario.* Bulletin 49-26.

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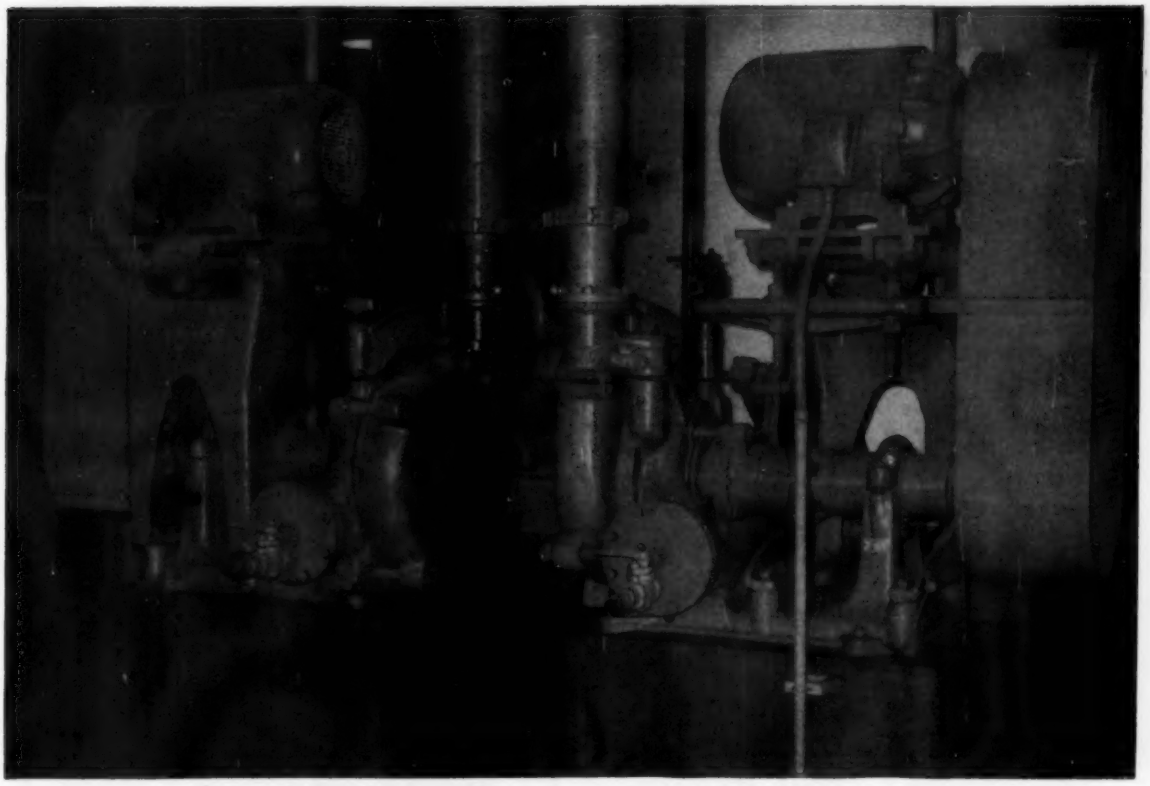


Longer life and money-saving performance come from the Ni-Hard parts of Wilfley equipment used to pump abrasive solids. Here are two of many Wilfley Model "K" pumps that handle slurry in leading cement plants.

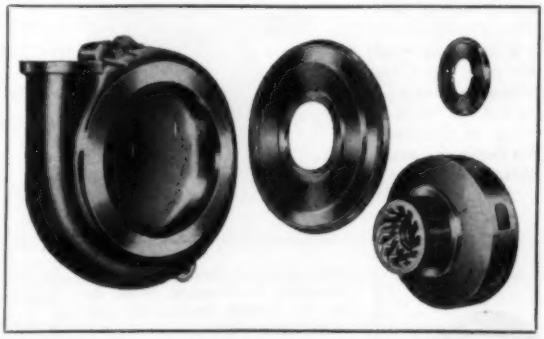
Wilfley + Ni-Hard means longer life for pumping abrasives

A. R. WILFLEY & SONS, INC., Denver, Colo., is one of the pioneer and leading manufacturers of centrifugal sand pumps. For parts of the pumps subject to abrasive wear, Wilfley offers Ni-Hard* nickel-chromium white iron castings.

Performance records of Wilfley pumps operating under the severest conditions prove that Ni-Hard castings provide maximum resistance to abrasion from solids. This is the key to high output, low-cost pumping.

To Wilfley customers, Ni-Hard parts mean a substantial bonus tonnage of solids pumped between changes. Wherever you find abrasion a problem, Wilfley's answer can cut your costs and add to your equipment life. Specify Ni-Hard abrasion-resisting iron for problem parts on new and replacement units.

*Registered trademark



Wilfley pump components are cast of Ni-Hard nickel-chromium white iron to assure long life and low-cost pumping no matter how abrasive the solids handled.

INCO TRADE MARK **THE INTERNATIONAL NICKEL COMPANY, INC.** 67 Wall Street New York 5, N. Y.

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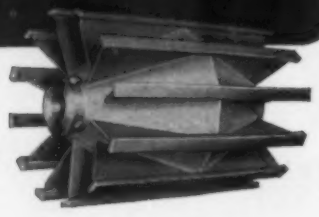
OF HOURS OF DEPENDABLE OPERATION AT LOWER COST

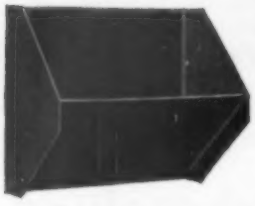


- SELF CLEANING
- STRONG REINFORCED WELDED CONSTRUCTION
- LOW COST

STANDARD WING TYPE SELF-CLEANING PULLEY

So strong it can withstand the most punishing loads without flinching because its all-steel welded construction gives it far greater strength with less weight at lower cost.

CONTINUOUS ELEVATOR BUCKET STYLE #2



Built to take the hardest use you can give it and come back for more, this bucket is typical of the complete line of low cost, rugged Standard Steel Buckets — available in Salem, Style "A," shelf type and other continuous style buckets.

STANDARD BIN GATE

Speed material handling with this Standard gear-operated bin gate, which has all-steel welded construction. Other styles in Standard Bin Gates also available.

Slash material handling costs by converting to Standard. Write today for catalog showing the complete Standard line.

The Standard Metal Mfg. Co. SINCE 1921

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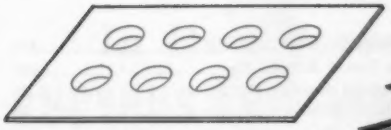
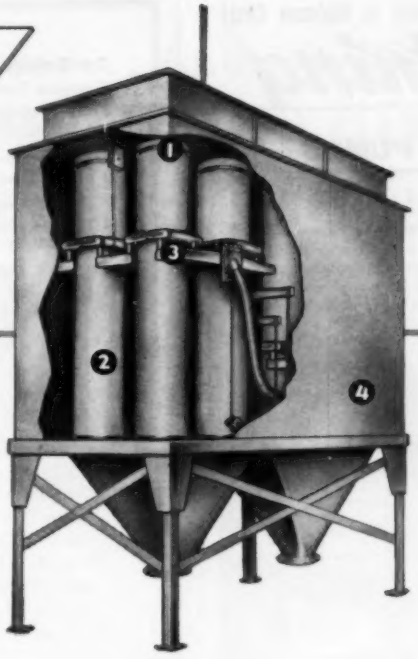
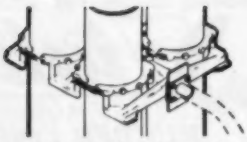


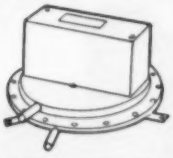
1 Air enters plenum casing at top of Series 12 Aeroturn for equal distribution to all filter bags. Bags are of felt . . . with higher filtering efficiency than woven material. Tiny pores hold even submicronsized dust particles. Cloth area is less than ⅛ that of shaker bags.





3 Self-adjusting blow rings* travel length of filter bag exterior . . . discharge reverse-air-jet into bag which blows accumulated dust off bag walls. Cleaning never interferes with filtering . . . which maintains peak efficiency. Aeroturn remains on the job continuously.

2 The air travels downward through the filter bags, assists delivery of dust into hoppers below . . . escapes through bag walls. Even distribution of dust puts every square inch of the filtering surface to work . . . avoids clogging . . . permits air to escape easily.



4 Automatic pressure switch* controls blow ring operation. Above normal pressure loss automatically actuates blow rings. When pressure loss normalizes, blow rings stop operation. Self-cleaning occurs as often or as little as needed . . . avoids over-cleaning.

Up to 75% Lower Installation Costs—99.9%+ Efficiency with KOPPERS Series 12 Aeroturn Dust Collectors!

Factory-assembled and test-operated, Koppers Model D Aeroturn Dust Collector combines features of Series 12 with unusual compactness. Capacities range from 500 to 4,800 CFM.

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Aeroturn's remarkably high filtering efficiency slashes your plant and machinery maintenance costs further than can any other dust collector. Heating and cooling costs tumble because air can be recirculated . . . cleaner than outside air. Employee and community relations are improved. Yet Koppers Series 12 Aeroturn costs you less to install . . . less to maintain. Space requirements are far smaller.

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OUTLAST METAL LININGS 5 TO 10 TIMES!

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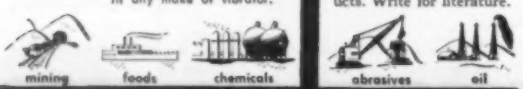

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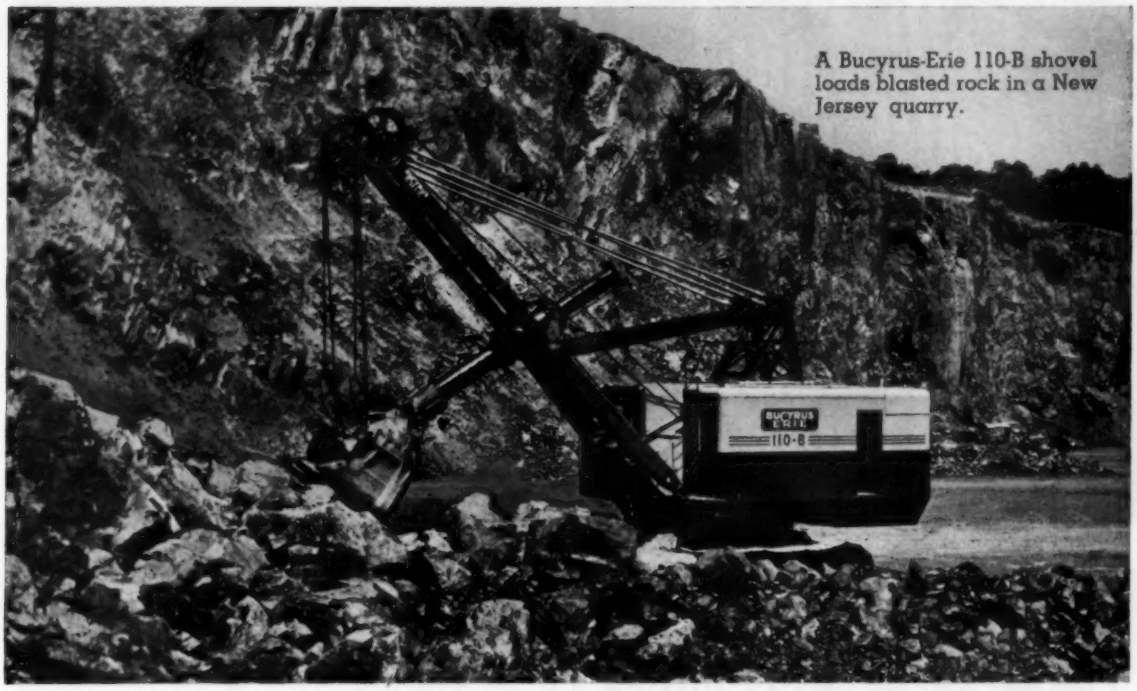

A Bucyrus-Erie 110-B shovel loads blasted rock in a New Jersey quarry.

In every design and construction feature Bucyrus-Erie Ward Leonard electric shovels are built to save you money. They have the capacity and performance ability to deliver high output at an economical cost per yard.

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63155

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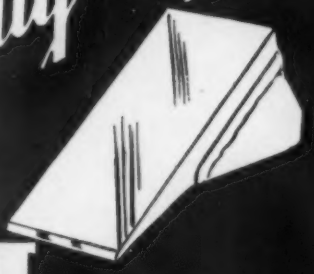

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AJAX Flexible couplings

Ajax Series D-100 Dihedral Couplings handle shaft misalignment, — offset, angular and end float up to 12°. Patented tooth design permits far less tooth clearance and provides more tooth area in contact under misalignment than with any other shaped tooth. No end-of-tooth wear, even under maximum misalignment.

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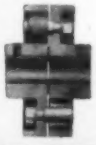

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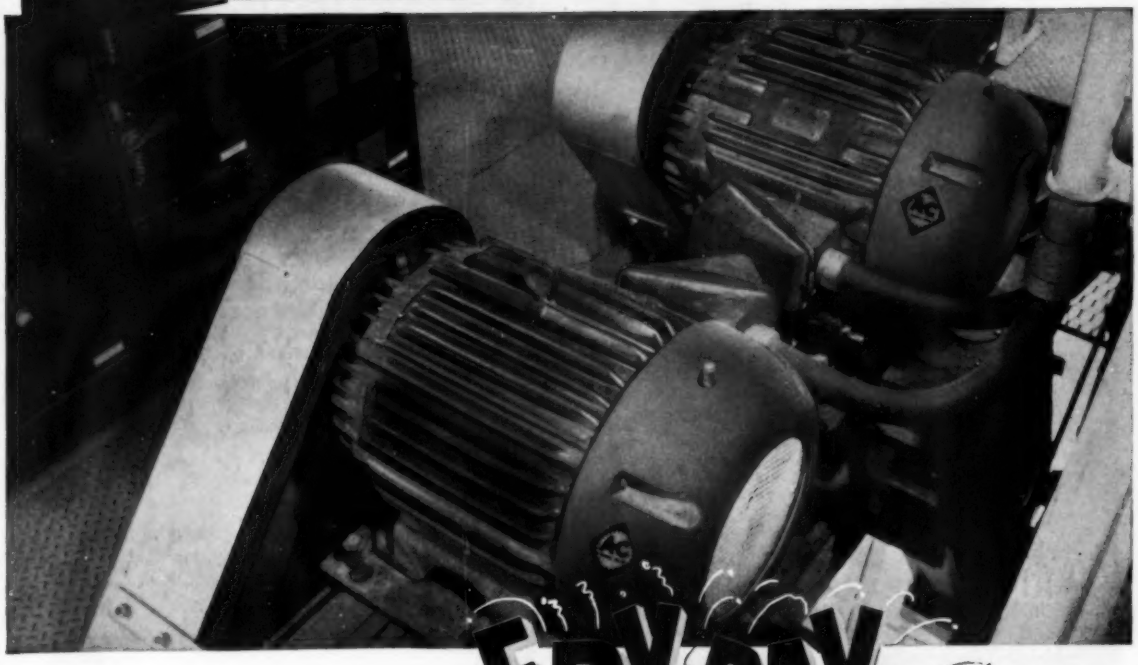

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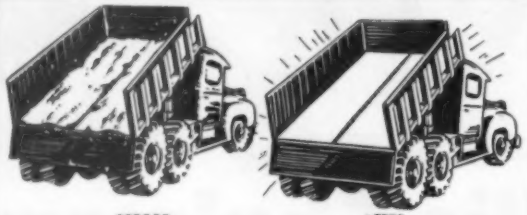

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MORE THAN 300 LEADING MANUFACTURERS

are already putting

SKF TYPE "C" BEARINGS

in their products

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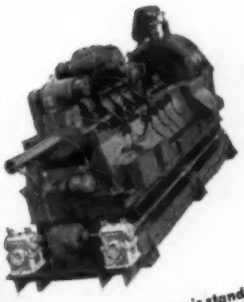

Cleveland worm gearing is standard on these fully-automatic machines which thread oil field pipe to rigid A.P.I. specifications, ranging from 1¼" to 13⅜" O.D. In addition to worm gearing inside the machine, note two Cleveland Worm Gear Speed Reducers in foreground.

On job 18 years, CLEVELAND drive is good as new

AFTER 18 years of continuous service in a well-known pipe mill in Pennsylvania, a Stamets pipe threading machine had its first major overhaul. When the Cleveland worm gearing was removed from the machine it looked almost like new, showed only slight traces of wear. This unretouched photograph reveals the splendid condition of both the worm and gear. In fact, the gearing is in such fine shape that it was put right back in the machine—probably good for another 18 years of strenuous pipe threading.

This example is one of thousands of Cleveland worm gear drives, many made 25 and even 30 years ago that are still in service today. They serve in every phase of American industry, drive every type of mechanical equipment where a powerful, trouble-free, right-angle drive is wanted.

For full presentation of the many types and sizes of Cleveland worm-gear drives available, write for Catalog 400. The Cleveland Worm & Gear Co., 3280 E. 80th St., Cleveland 4, Ohio.

Affiliate: The Farval Corporation, Centralized Systems of Lubrication.
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CLEVELAND
Worm Gear
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Kraft Bag Corporation comes closest to being the most completely integrated manufacturer of multiwall shipping sacks in the industry!

Check this chart and see for yourself why Kraft Bag Corporation should be your supplier!

Tell us when we may call to discuss your requirements.

FEATURES	KRAFT BAG CORPORATION	OTHER SOURCES ?
Forest Lands	✓	
Pulp Mill	✓	
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Multiple Bag Plants	✓	
Natural Kraft	✓	
Colored Kraft	✓	
Bleached Kraft	✓	
Creped Kraft	✓	
Wax Laminated Kraft	✓	
Asphalt Laminated Kraft	✓	
Wet-Strength Kraft	✓	
Water Repellent Kraft	✓	
Stak-LOK Super Rough Kraft	✓	
Valve Bags—sewn or pasted	✓	
Open Mouth Bags—sewn or pasted	✓	
Flat Sewn Valve Bags	✓	
Flat Sewn Open Mouth Bags	✓	
KRAFT-lok Valve Closure	✓	
Creped Tape	✓	
Gummed Tape	✓	
Filter Cord	✓	
Sewing Thread—(the only material we do not produce ourselves)		
1-2-3-4 Color Printing	✓	
Art Department	✓	
Bag Development and Research	✓	

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